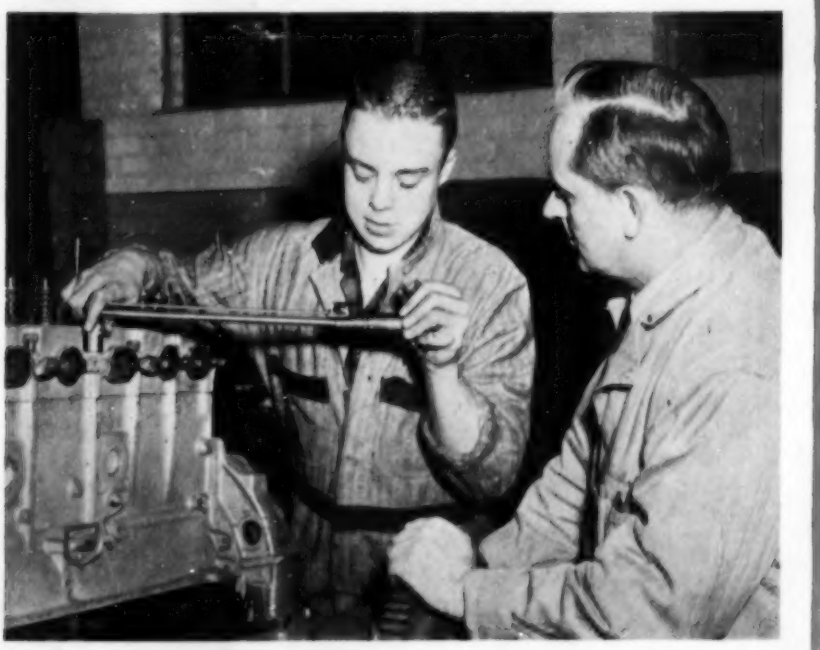
June, 1956

Vol. 45
No. 6

Industrial Arts and Vocational Education



The Shop Teachers' Professional Magazine

Photo: Bell Telephone Laboratories

FROM LITTLE THINGS

TREMENDOUS CONSEQUENCES

The transistor is a tiny bit of metal the size of a match-head. It has hairlike wires raying out from it. Not only small in size, it is trivial in appearance. Yet from its creation, its existence, its implications arises the prospect of tremendous advances in radio and television design, in the electronic "thinking machines" that now perform in minutes or hours calculations so complex as to require months and years of unremitting human effort.

From small things, tremendous consequences flow. Happenings in childhood, boyhood, too small to be noticed by uncomprehending adults may bend, warp, distort the youngster's life into despair . . . or again, may open a window to a vista of sunlight illuminating the clear path to success, to mental and spiritual development, to useful and rich careers. Conscientious educators know the importance of the seemingly trivial and wise instructors in mechanical drafting never make the mistake of belittling anything connected with their work. This is a subject that lies upon the broad avenue leading directly to engineering and science. Then why, they say, divert the youngster's attention, cool his enthusiasm, sap his sincerity by saying it does not matter what drawing instruments he uses? Why say that a few pennies pinched in their purchase can ever compensate for the opportunity lost to inspire the boy by the fine and inspiring quality and craftsmanship of a good set? The selection of drawing instruments may be but a moment in a long life, but the consequences can flow far into the future.

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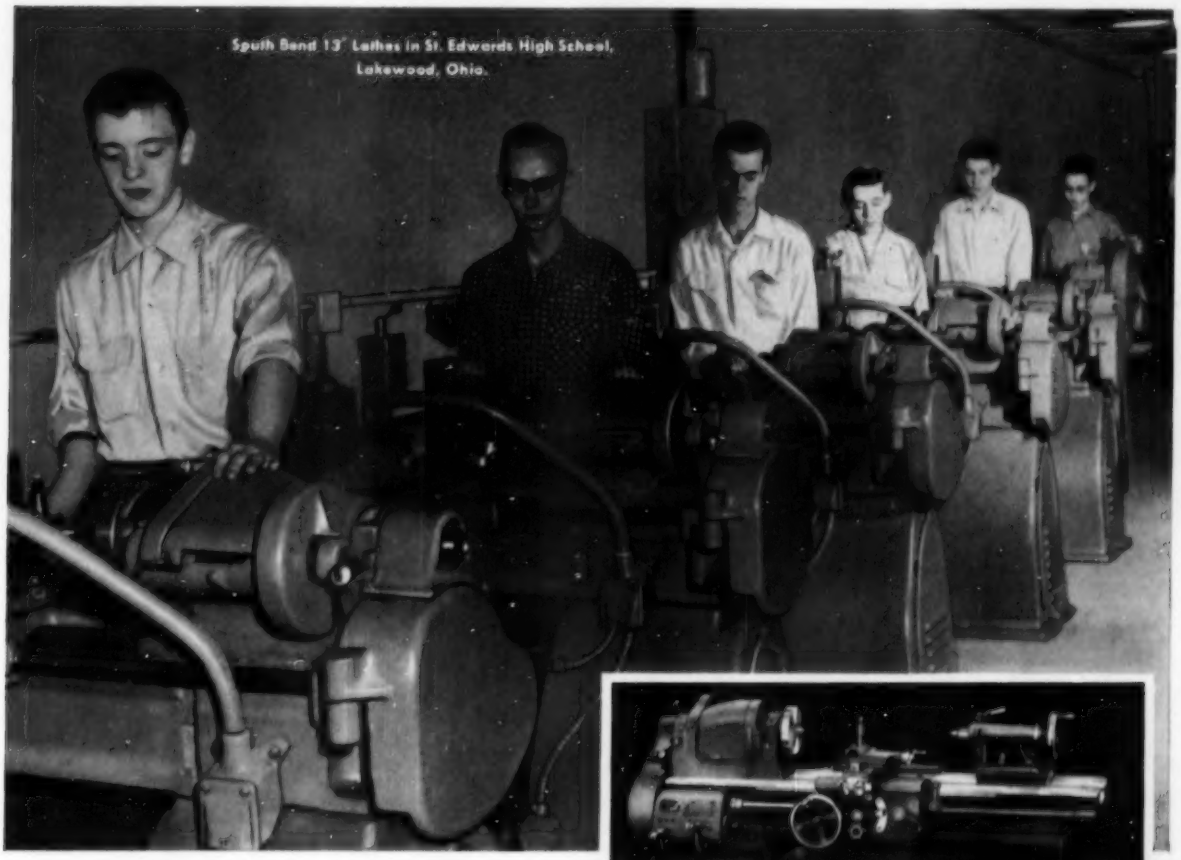
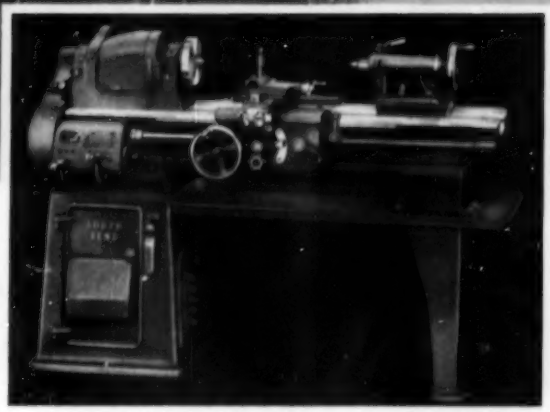


South Bend 13" Lathes in St. Edwards High School, Lakewood, Ohio.



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JUNE
1956

VOL. 45 NO. 6

Industrial Arts and Vocational Education

The Shop Teachers' Professional Magazine

Published on the 15th of the month preceding the date of issue by THE BRUCE PUBLISHING CO., 400 North Broadway Milwaukee 1, Wis. • CENTRAL OFFICE: 20 North Wacker Drive, Chicago 6, Ill. • EASTERN OFFICE: 225 Broadway, New York 7, N. Y.

★ ★ ★

This Month's Cover

The cover picture of this issue shows Erwin Bischoff, instructor in auto mechanics at the Middlesex County Vocational and Technical High School, New Brunswick, N. J., as he explains to Edward Vroom, student, the proper use of the torque wrench.

This picture was sent to us by Charles F. Green, school photographer.

Are You Changing Your Address?

If you are changing your address for the school year 1956–57, will you please notify our circulation department as soon as possible? If you will let us have your new address by August 15, 1956, you can be sure you will not miss any copies of INDUSTRIAL ARTS AND VOCATIONAL EDUCATION magazine.

When sending in your new address, kindly give us your old address as well, and also include your zone number.

★ ★ ★

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Association News

AMERICAN INDUSTRIAL ARTS ASSOCIATION CONVENTION

Milwaukee was the mecca toward which the industrial-arts educators of our nation traveled as the American Industrial Arts Association met in that city to hold its 18th annual convention April 25, 26, and 27, 1956.

The American Council on Industrial Arts Teacher Education, and the American Council of Industrial Arts Supervisors, affiliates of the American Industrial Arts Association, held their 8th and 6th annual convention respectively on April 24 and 25.

Milwaukee, under the leadership of Roy A. Radtke, director of industrial arts in that city, did itself proud in presenting the visitors the very best in accommodations for small and large group meetings, commercial exhibits, visits to industrial plants and schools, guided tours at public museums, art galleries, and educational exhibits and demonstrations.

The commercial exhibits also were quite outstanding and the men in charge were kept busy demonstrating and showing their wares. There were sixty-seven different firms represented by these exhibts.

Roy A. Radtke (left), the new president of AIAA, Burl N. Osburn, the retiring president, and DeWitt Hunt (right) discussing a weighty problem

— Photo, The Milwaukee Journal

Outstanding as education exhibit was the one titled "Civilization Through Tools." It consisted of ten 4 by 6-ft. panels which depicted the history of civilization as portrayed by the tools that were used by man through an estimated time span of one million years.

Exhibited in the same room were beautiful examples of student and teachers' craftsmanship and artistry. Among these were the outstanding examples of art metal work sent in by Emil Kronquist, Maurice Overholt, Alexander Bick, and numerous other teachers.

The student projects exhibited in Mechanics Hall Auditorium presented examples of the excellent industrial-arts work produced in our local and suburban junior and senior high schools.

Students from 15 industrial teacher education colleges and universities gave demonstrations during morning and afternoon sessions on Friday.

The theme for program No. 1 Tuesday morning was "Evaluation and the Industrial Arts Teacher in Preparation."

William J. Micheels, the first speaker, presented a short, historical sketch showing that evaluation is a comparatively new term in industrial-arts education. He pointed out that the testing movement began somewhere between 1910–1920. Testing must be understood and correctly used. Grading must be significant and objective, and research must be made a more important part of our teaching.

J. C. Spry spoke on "The Role of Evaluation in the Selection of Prospective Industrial-Arts Teachers." He pointed out that we must attempt to find people who have average or higher intelligence, are educated, have the right philosophy, professional skill, insight into character, and high ideals.

Athol Baily presented "The Role of Evaluation in the Effective Placement and Follow-up of Industrial-Arts Teachers." He said that little has been written about this subject. Industry tests its products, and we ought to follow their example.

Program No. 2 was devoted to the yearbook presentation.

John A. Whitsel was the chairman. Wesley Stephens of the McKnight and McKnight Publishing Company made the presentation of the book to the association.

Kermit A. Seefeld, Elroy W. Bollinger, John A. Fuzak, M. Ray Karnes, Calvin M. Street, Robert L. Thompson, Walter Waetjen, and John A. Whitesel were authors present at this meeting.

Gordon O. Wilber was given the citation

(Continued on page 6A)

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JOINTERS — BELT AND DISC SURFACERS — FLEXIBLE SHAFT MACHINES

ASSOCIATION NEWS

(Continued from page 4A)

as Man of the Year in Teacher Education.

DeWitt Hunt and E. E. Ericson were both presented with testimonials of special recognition.

The new officers elected for 1956–57 are: president, R. Lee Hornbake, and secretary, Elroy Bollinger.

Program No. 3, Tuesday afternoon, had for its theme, "Evaluation in the Program of Industrial Arts Teacher Education." Ken Perry was the chairman.

Bruce J. Hahn spoke on the subject of "Evaluation of Industrial Arts Teacher Education Shop Classes." He pointed out that evaluation is a general process of arriving at judgments as to our achievement of course objectives. The greater the number of separate judgments the more accurate will be the composite judgment — which is evaluation.

Donald Maley spoke on the "Effective Evaluation of the Student Teaching Experience."

The evaluation of the experiences of the student should be based on how well the over-all objectives of industrial arts have been met.

John Jarvis presented a test item analysis form and an analysis of a test. He also showed and explained a monograph for assigning D-values to test questions.

Program No. 4, Tuesday at 3:30 p.m., had for its theme: "Improving Industrial Arts Teacher Education Through Evaluation." Robert Hutchcroft was chairman.

The first speaker, Raymond Van Tassel, spoke on "Evaluation of Methods and Materials of Instruction." He stated that such an evaluation must also include an evaluation of the teacher, the pupils, facilities, community, and administrative leadership.

Lawrence Borosage discussed "Evaluation of Experimental Practices." The teacher can set up research problems in his own class. He may also co-operate with professional researchers.

The experimental attitude should be developed in the students in the teacher education colleges.

Roy Bergengren spoke on the "Integrating and Interpreting the Results of Evaluation." Sound evaluation is absolutely necessary if we want to progress in our educational efforts.

Tuesday, 5:00 p.m., was the time set aside for the Epsilon Pi Tau dinner. It was attended by 60 to 70 members who made it a veritable family gathering.

William E. Warner was the chairman.

Wednesday morning, convention program No. 5 was devoted to the council yearbook — progress reports, suggested topics, and the annual business session of the American Council of Industrial Arts Teacher Education.

Program No. 10, Wednesday at 10:30 a.m., was devoted to safety education.

It was agreed to have a section in the *Industrial Arts Teacher* magazine devoted to safety and to affiliate with the National Safety Council.

Program No. 11. "The Place of Photography in Industrial Arts Education" was presented by a discussion group of which Harry A. Goldstein was the leader.

He stated that photography belongs to the graphic arts. It was originally introduced as an extracurricular subject. Usually the students had to furnish their own cameras and materials as there were no funds to carry on the work. Now that the graphic arts have taken over all of this has been changed.

The discussion was continued by R. McKay, A. D. Facey, and Otis H. Chidester.

Program No. 12, held at 8:00 p.m., Wednesday, was presided over by Ivan Hosteteler.

Kenneth F. Perry spoke on "Some Basic Considerations in Structuring the Curriculum."

Children must be prepared to live and make a living. If the subject is made interesting to the student he learns more easily. Industrial arts lends itself to this more readily than other school subjects.

Walter R. Williams, Jr., spoke on "Examples of Current Curricular Practices." He said that while teachers may not be known personally, yet well-taught students are prima facia evidence that they have been in the hands of good teachers.

Program 13 had for its theme "How Do We Teach?"

Robert S. Swanson gave an outstanding address titled "Contributions of the Psychology of Learning to the Teaching of Industrial Arts." He emphasized that students should be taught in situations that are similar to industrial situations. He also stressed that understanding is more important than teaching the pupil by memorizing processes.

Iva D. Madden was chairman of the discussion group on "How Do We Motivate," and Ethan A. T. Sevendsen was discussion leader.

Amos Coleman, John M. Hurley, and W. C. Bohnsack formed the discussion panel.

At the Friday morning session, J. A. Fuzak was the chairman.

J. Wayne Wrightstone spoke on "Evaluation in Industrial Arts," and M. Ray Karnes presented the subject of "Improving and Evaluating." He emphasized that after a change has been made it must be scrutinized to see whether good has been achieved by the change.

Harry Pederson was chairman of the all-day student-conducted programs on Friday.

(Continued on page 10A)

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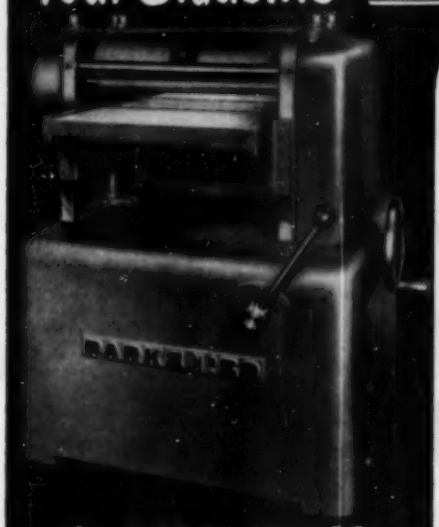

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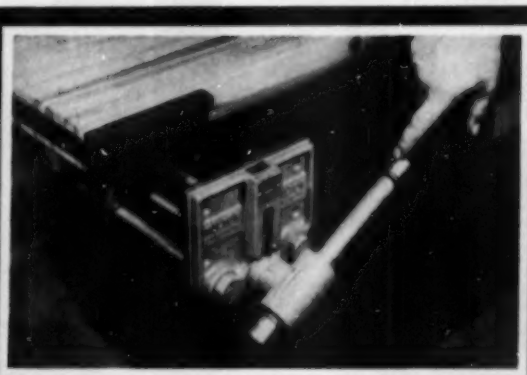

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Industrial Arts and Vocational Education
The Shop Teachers' Professional Magazine
JUNE 1956

A Publicity Medium Worth Trying —

Industrial Arts and TV

WILLIAM C. ROCHELLE, JR.
Person-in-Charge
Audio-Visual Aids Department
Public Schools
Schenectady, N. Y.

The director's voice was loud and clear as he said, "Will the crew come home?" The clock indicates less than a minute. Flood lights are on, cameras are in place, the mike boom is overhead, all is quiet now.

Suddenly music breaks the silence, followed by the announcer's voice, "Believing that home is what you make it, the Fixit Club presents a program to help you solve perplexing household problems, ranging from dripping faucets, cleaning a trap, to repairing and purchasing furniture."

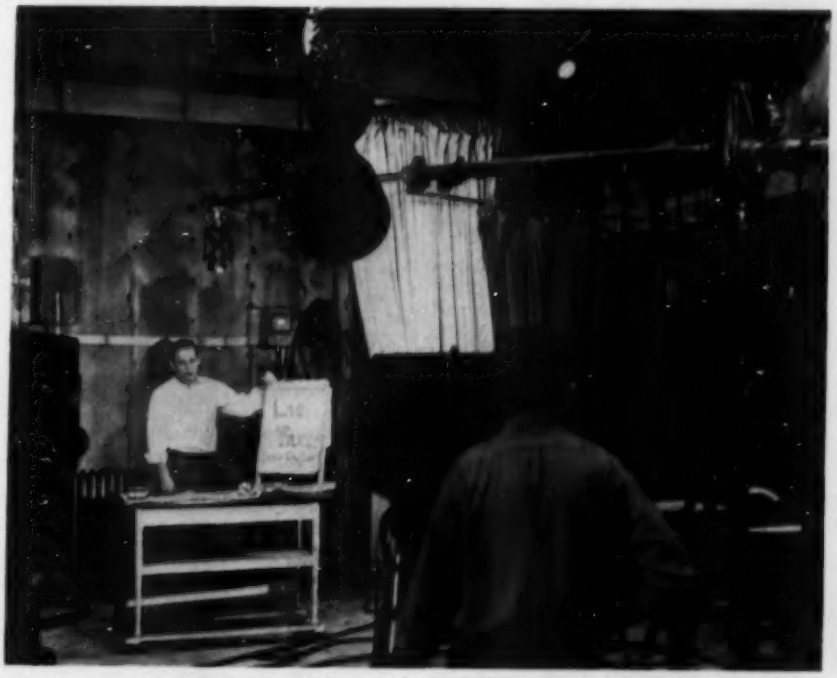
"Ready to start today's program is William Rochelle. You're on the air."

Forgotten nerves are jumping all through your body. You would like to run for the exit, but you don't, because for the next 14 minutes there is a job to be done; that of presenting a phase of industrial arts education to all in the community able to turn a switch in living rooms, schools, and office buildings. Here is an opportunity to do the kind of a public relations job you have always dreamed of but didn't have the time or the means by which to do it.

But here it was — and the writer found himself in a position which he had often envisioned.

With the formation of the Mohawk Hudson Council for Educational Television, consisting of 126 members from public, private, and parochial schools, colleges, and other educational organizations in the capital district, television station WRGB, located in Schenectady and operated by the General Electric Company, offered the hour from 10:30 a.m. to 11:30 a.m., five days a week for the televising of educational programs.

The programming was arranged in three series of 13 weeks each, with the Schenectady public schools taking the responsibility for one-half hour each day during the first period for the presentation of eight telecasts. Of the eight, the Fixit Club, as we were to be called, was one.



Ready for telecasting one of the educational programs

Our set was a simple one, realistic in every sense. A bench and stool along one side of the studio, with curtains pulled back so that the rough wall of the building and hanging wires gave the effect of a basement.

Because we wished to convey the informality of working in the home shop to our viewers, all of the people appearing on the show were attired in typical informal work clothes used in the home.

The first six programs were planned in advance, leaving seven open to fill anticipated requests from viewers. Our original plan called for a demonstration concerned with repairing an appliance, a piece of furniture, plumbing, etc., each week, and one step of the refinishing process so that those watching could refinish a project at home or school right along with us.

However, from the mail we received, it soon became apparent that the refinishing was the high light of each show and thus six of the programs were devoted entirely to that subject. During the 13 weeks, we received over one hundred cards and letters, 95 of which were concerned with different phases of refinishing furniture, floors, doors, and general woodwork in the home.

As a result of this weighted correspondence, we offered a mimeographed booklet on request which outlined methods and procedures of refinishing different woods. To date, over fifty have been mailed to interested viewers.

Six of the shows were conducted by the writer, alone. However, on October 28, 1953, a summary of the work at the Fixit Club appeared in "Variety," under television reviews.

One suggestion appeared in the article to the effect that we might use students or other lay people as a means of improving our instruction.

This suggestion was followed, and for the next seven weeks we invited others to assist.

Several advantages were immediately clear:

1. The monotony of one voice disappeared and the program picked up added meaning.

2. It is easier to clarify and illustrate certain technical points when the instructor is actually showing someone how to do it in the studio.

3. And last, but not least, the experience of this new instrument of education is shared with others.

We have heard it said that it isn't what one says on television that enables people to learn, but rather what they see clearly. In a nutshell then, it's the seeing that counts. With this in mind all demonstrations were supplemented wherever possible by teaching aids which had eye appeal. Such visual aids as standards showing each step in tying an underwriter's knot; faucets on stands which could be placed under the nose of the camera for all to see the repacking and rewashering demonstration; a flip chart, four or five words to a page, arranged in different positions on each sheet, with diagrams for lessons on circuits and fuses; and, of course, demonstration projects from lamps to bicycles, from furniture to fuse box.

We closed our series in the month of December. Our nerves had long since returned to normal, the spotlights no longer seemed unduly warm, the cameras became a part of the scenery, the last minute was again like all others, and the announcer's voice was as common as day and night. Behind us were the many hours of preparation each week and writing scripts was as easy as a letter home.

We shall always be grateful to the fine group of people at WRGB and to those from the school system for their tireless efforts to make the show a success.

Most important, however, we were grateful for the opportunity to present a phase of industrial arts to the community and to show, "Home is what you make it."

Believing that the majority of industrial-arts instructors have not had the opportunity to participate in programs of this nature, and because many will be confronted with such a planning problem in the immediate future, we submit the following outline of programming with the hope that it will be of assistance to others able to take industrial-arts activities before the TV cameras.

OUTLINE OF TELECASTS

I. Rewiring a lamp
   - A) Worn-out cord
   - B) Rewiring a plug
     1. Underwriter's knot
   - C) Rewiring socket
   - D) First step in the refinishing process
     1. Removing old finish

II. Rewashering a faucet
   - A) Repacking faucet
   - B) Second step in refinishing process
     1. Sanding and discussion of sandpaper numbering and manufacturing

III. Electrical circuits in the home
   - A) Use of flip chart to present material
   - B) Fuses and how to change them
     1. Use a fuse box mounted on stand and wired to lamp
     2. Safety precautions in changing fuse

IV. Third step in refinishing process
   - A) Review steps to date
   - B) Kinds of stain
     1. Show oil, water, and spirit stains and demonstrate how to mix and apply them
   - C) Cleaning of brushes — solvents, etc.

V. Fourth step in refinishing process
   - A) Buying wood filler
   - B) Coloring filler
   - C) Applying filler
   - D) Method of wiping filler off
   - E) Household hints:
     1. Demonstrate how placing holes around lip of paint can will prevent paint from building up

VI. Fifth step in refinishing process
   - A) Sealing of wood
     1. Story of shellac
        - *a*) Where it is from
        - *b*) How made
     2. Application of shellac as a sealer
     3. Application of floor sealer
     4. Cleaning of brush

VII. Readying a bicycle for fall and winter riding

Addition of a fifth-grade boy and his bicycle for this program
   - A) Adjustment of handle bars
   - B) Adjustment of seat to fit rider
   - C) Check pedals for tightness, straightness, and proper spinning
   - D) Install new light on front of bike
   - E) Check reflector and place new reflection tape above it on rear fender
   - F) Check wheels for wobble and explain what happens if this becomes severe
   - G) Check spokes for tightness and adjust if needed
   - H) Discussion of riding habits
     1. Where to ride
     2. Hand signals
     3. Rules for riders on the road

(The boy did all of the above adjusting, Mr. Fixit questioned and suggested.)

VIII. Sixth step in refinishing process
   - A) Rubbing down of sealer with steel wool
   - B) Application of first varnish coat
   - C) Application of second shellac coat if a shellac finish is desired
   - D) Application of a floor sealer if that type of finish is desired
     1. With rag
     2. With brush

IX. Seventh step in the refinishing process
   - A) Rubbing down first coat
   - B) Application of second coat of desired finish
   - C) Cleaning of brushes used in all of the materials we have worked with. Why we need different thinners, how to tell them apart by smell.
   - D) Household hint
     1. Use of new type of lamp plug

on market where wire and insulation are inserted for use

X. Last step of refinishing process
(Two ladies from adult course in furniture refinishing joined instructor for this program.)
A) Rubbing final coat with pumice stone and crude oil. This step done by one of guests.
B) Second guest demonstrates and explains how she cares for her furniture after refinishing it.
1. Washing
2. Waxing
C) Discussion of other adult courses they have taken, why they take them and what they get from them

XI. To upholster a dining room chair
Our guest for this show is a man whose business is upholstering furniture.
A) How to cut foam rubber
B) Cutting material for seat
C) Demonstrate tacking, pulling tight, placing materials on corners and around uprights. Methods of attaching gimp.
D) Use of magnetic hammer, tacks, brass head tacks, etc.

XII. Safety at home during Christmas season
Two high school students were our guests for this program. They were to put up a tree at a party and asked Mr. Fixit to help check the decorations before starting the job.
A) Demonstrates how to check a string of lights for shorts or defects. Also how to find a burned out bulb on a series string.
B) Check ornaments for broken ones.
C) Discuss inflammable materials and dangers of using them.
D) Demonstrate which will burn and which will not.
E) Dangers involved in window decorations.
F) Overloading electric circuits in house by using all new appliances.
G) General discussion of safety, wrapping paper, dangers with small children.

XIII. Discussion concerning pieces of furniture on set made by instructor
Guest to lead discussion and direct questions
A) Discuss cobbler's bench, where did plans come from, some of high lights. Dowels, box joints, legs, etc.
B) End table lamp — copy of oil lamp made in walnut
1. Story of the wood used
C) Bird cage tilt top table
1. Can be used as table or Lazy Susan
D) Dining room wall shelf
1. Finish, plans, etc.

Let's Dispel Some Bad Habits

ROSS STORM
Milwaukee, Wis.

This article is directed, in particular, at authors, would-be authors, and publishers of books and magazines which treat of electronics or some branch thereof. However, instructors and students in electrical classes will themselves do well to continue reading.

I am thinking of two bad habits that nearly all people who are *in the know* are of guilty of. The first: they speak or write of *a flow of current* or *current flow*. On the face of it, some will ask: "What's wrong with that?"

It is wrong, plenty wrong, and here is why.

First of all, take a long, critical look at the definition for *current* in any dictionary. We find that *current* means *a flow or movement* of something; e.g., a river, electrons, etc. As the word applies to electronics, current means *a flow or movement of electrons* (sometimes, a *flow of ions*). Now, almost anyone should be able to see where the gross error is. Since the word *current* already means *flow* or *movement*, when we say *current flow* we are actually saying *flow flow*. Silly, isn't it? The same applies to *a flow of current;* we are saying *a flow of flow*.

The error wouldn't be so bad if, through general use, *current* had come to mean only *electron* or *electricity*, but it hasn't. And the error shouldn't be condoned simply because it has become general, or, as some might think, it isn't too apparent. It is general, and it certainly *is* apparent.

The situation was somewhat the same years ago concerning the *direction* of current. In most discussions it made little difference whether current was from + to —, or from — to +. For practical purposes, i.e., in circuit analysis, design, etc., the assumed direction of current does not affect the outcome. However, I think you will find few, if any, modern textbooks or instructors disseminating the information that *electrons* move from + to —; they don't.

How did this situation of *current flow* come about? It's really difficult to put a finger on anything and say "This is it." But a contributing factor has been that many publishers of textbooks have employed editors who know little or nothing of the technical subjects they are supposed to edit. The error appeared in early books and was handed to students by instructors who used these books. Eventually, some of the students became instructors and writers themselves, and the error was perpetuated. It has become so widespread that it is found in practically all textbooks; in the grammar of lessons; in the oral language of people in the trade — even engineers and instructors (who should know better).

Whether or not it is too late to start

Girls in the school print shop

Photography, Melvin Cheeseman, graphic arts department, Senior High School, Tucson, Ariz.

Photograph sent to us by Harry A. Goldstein, instructor

correcting it is a moot point. But we could at least make an attempt. In all further publications it could be eliminated; eventually wiped out. The fact remains: general use has *not* made it correct. It's just wrong — technically and grammatically.

The second common error along this line, which is nearly as bad, concerns the use of *a.c.* and *d.c.* These are, respectively, the abbreviations for *alternating current* and *direct current*. In many textbooks, magazines, and technical papers it is found as *a.c. current* and *d.c. current*. Here the errors are a little more obvious: *alternating current current* and *direct current current*. That extra *current* following the abbreviation is decidedly superfluous.

There are several other errors, too, the most outstanding being the use of *a.c. voltage* and *d.c. voltage*. I won't go into these, since by reading the abbreviations as though they were complete words the errors become plain. It would certainly be much more logical, though, to say *alternating voltage* or *direct voltage*.

In correcting the grammar built around abbreviations, the simplest way is to read the abbreviation as if spelled out. It can be detected almost immediately if the grammar is wrong. Fortunately, the use of *a.c. current* and *d.c. current* are not often heard in oral usage; unfortunately they are glaringly apparent in the written word. To eliminate *flow of current* and *current flow* requires a little more thought; in some cases the word *flow* can simply be deleted, while others may require a change in sentence structure.

The whole mess boils down to the illogical use of the word *current*. If the combining of other words with this one is carefully watched, we won't wind up with any more of these errors; much to the appreciation of those who will come after us.

A Good Suggestion —

Use This at Your Next Open House

JOS. J. LUKOWITZ
Milwaukee, Wis.

The visitors at *Open House* usually see only the tangible product of our work — the finished projects on display. True, at times we have boys actually at work on projects and this action element in our "Open House" is always more interesting to the visitors than a conventional static display of finished projects only.

Teachers of metalwork, woodwork, some forms of electrical work, and others who use jigs in the construction of projects have a fine opportunity to bring before the public some of the more intangible values of school shop work by displaying jigs and the projects or parts of projects produced with the aid of them. This can be very effectively done by having boys actually using the jigs to produce the parts, or by having boys show the jig and the part it produces at the same time describing the process.

A sign or poster similar to the one shown in Figure 1, placed with the display of jigs or in the area where the jigs are being used, will do much to build a better understanding and good public relations with the men visitors, especially those who work in manufacturing industries; and that includes a very high percentage of all workers.

Some years back the use of jigs in school shops was frowned upon by some teachers who felt that the pupils were being denied the opportunity of acquiring skills because the jig either held or guided the tool or the material. True the development of skills is still an objective but the construction and use of jigs with the inherent educational values is highly desirable. Every manufacturing industry uses jigs, and their production and use should be a part of the boy's training in school shop work. He will most certainly encounter them when he is employed by industry. By previous contact with jigs in school he will be better orientated and more valuable as an industrial worker in our highly technical age with its stepped-up mass production.

If as a shop teacher you have never used jigs in your classes you will be surprised and well repaid for the thought and effort you expend in their production. The use of jigs will make it possible to construct a vast number of projects hitherto thought to be too difficult.

JIGS USED IN CONSTRUCTING AN ELECTRIC MOTOR

- **A jig is a device which holds and locates a piece of work and guides the tools which operate upon it.**
- **The use of simple jigs in work of this kind gives boys some idea of industrial processes performed in factories.**
- **The use of jigs has made it possible for manufacturers to reduce the cost of production.**
- **This has resulted in lower selling prices, an expanded market, and increased employment to serve the larger market.**
- **The net result is a higher standard of living for all.**

Fig. 1. Poster explaining the use of jigs

Interest Your Students in Engineering —

Engineering Clubs for High Schools

ROY H. DUNGAN
Ambler Joint Junior High School
Ambler, Pa.

Is your school attempting to help our nation in its search for future engineers? Are there potential engineers in your school who have changed their vocational plans because of *rumors* that engineering studies are dull, drab, and difficult? Perhaps your answers to these questions may urge you to read on.

The industrial-arts teacher can and should play an important role in helping the youth of today focus more attention on the profession of engineering. The crucial need for graduate engineers is being realized more each year. It is important that potential engineers among your student body be made aware of the many facets to a career in this field.

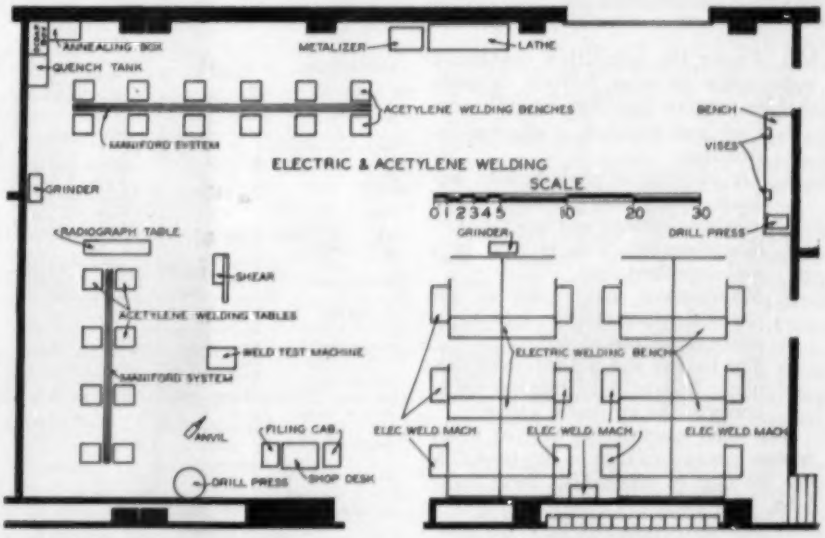
The majority of modern secondary schools include the club program as an integral part of the curriculum. It is through this medium that the industrial-arts teacher may do his share in helping the nation find the engineers it needs so badly.

Teachers of industrial arts are the logical choice for sponsoring and selling the profession of engineering to the high school youth by means of *the engineering club*. This club should be open to any junior or senior desiring information concerning engineering. This club would meet once or twice a week, depending upon the number of club periods available in the weekly schedule. When possible, the club meetings should be held in a drafting room.

The agenda for an engineering club meeting may contain such activities as listed below:

1. Vocational Guidance Literature
   a) Many publications concerning careers in engineering are available from various sources.
      1) Resource person — school librarian
2. Films
   a) Available through large industrial concerns and engineering societies.
      1) Resource person — director of visual education
3. Outside Speakers
   a) Professional engineers from the community
      1) Pre-briefing the speaker is important
4. Review of College Entrance Requirements
   a) Catalogs from schools of engineering
      1) Resource person — Guidance counselor
5. Field Trips
   a) Visits to local industries employing graduate engineers.
      1) Focus attention to variety of engineering duties
6. Related Club Activities
   a) Elements of slide rule calculations
   b) Practical applications of the principles of geometry in mechanical drawing
   c) Instrument drawing and lettering practice
7. Referrals to Guidance Counselor
   a) Club sponsor alert for signs of need for counseling
      1) Many interested students lacking in capacities required for engineering studies

To the average high school boy or girl, an engineering club would be of interest and fulfill a definite need. For those who find that they are not suited for the pure engineering sciences, the club program may be the means of informing them of the many related fields essential to the national interests and directly related to engineering.



Electric and acetylene welding, Mergenthaler Vocational-Technical High School. Submitted by Howard E. Ziefle, Principal, Baltimore, Md.

Location of Supplies

TAYLOR A. HARTER
General Shop Instructor
Teachers College
Oswego, N. Y.

The work of the general shop instructor is complex and diversified and encompasses more than his primary function — teaching. Before he can teach, his physical plant must be organized and kept running. Consider a few of the responsibilities which are expected of him. Among the many time consuming tasks which he must perform in order that his program may run smoothly are:

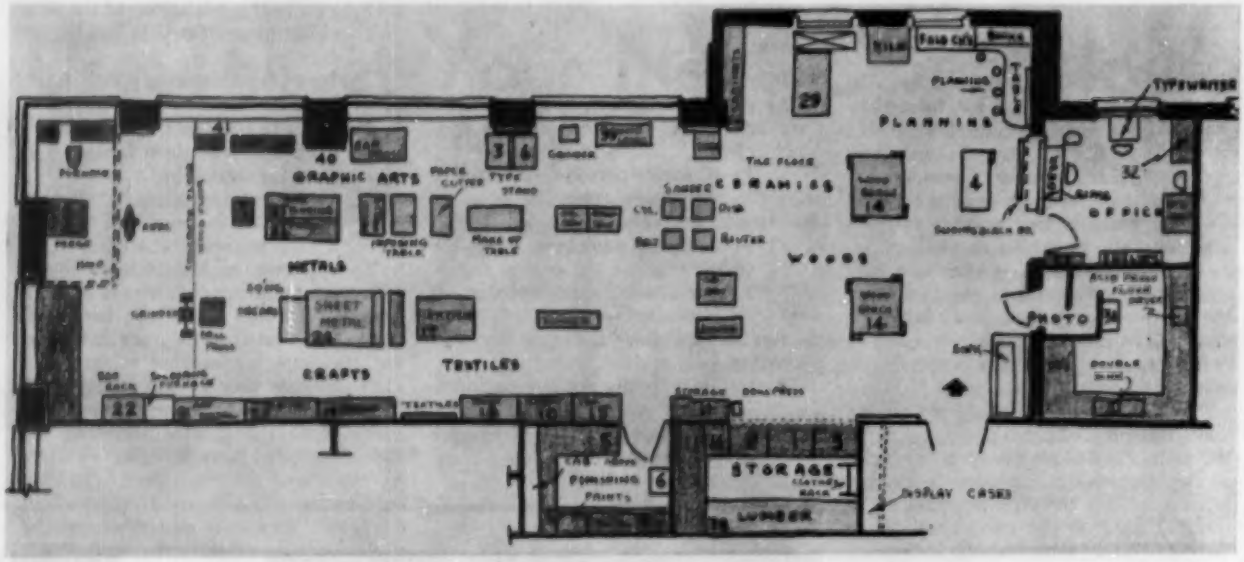
1. First and foremost — effective instruction.
2. The planning of projects with students which may be done either within or outside of class time.
3. Housekeeping. This is vital to a well-organized shop.
4. Maintenance and repair of the physical plant which inventories many thousands of dollars.
5. The buying and utilization of supplies. This activity requires many hours of the instructor's time.

The shop teacher has devised many unique systems so that he has time during the day to accomplish these many jobs.

A good personnel system which functions throughout each class period is just one example of how students can assist in running the shop. Personnel systems are patterned like those used in industry, so while the pupils are helping in shop organization there is a great deal of vocational guidance being accomplished. Such teaching techniques provide for as much guidance as working with various tools and materials. Where else in general education are there offered equal opportunities for taking care of the so-called *sixty per cent group?*

Since the function of the teacher is instruction, let us see how the time of a typical class period is devoted to this purpose. Most class periods are 45 minutes in length. Approximately a third of this time is consumed in group instruction, getting the class started and cleanup. This leaves 30 minutes for students to work and plan projects and for the instructor to give individual instruction. In a class of 20 (more often larger), then, the instructor has an average of one and one-half minutes per pupil to help with any difficulties. This includes helping them to plan projects or actual help with tools and materials.

This situation is aggravated by the fact that many instructors allow themselves to become *supply clerks* and spend much of their time answering the query, "Where is this tool kept?" A student can be directed to the place where he can find what he is looking for, but frequently it is quicker for the instructor to get it for him. As a result, after a whole term in a shop class, many students do not know where all the various materials that they use are stored.



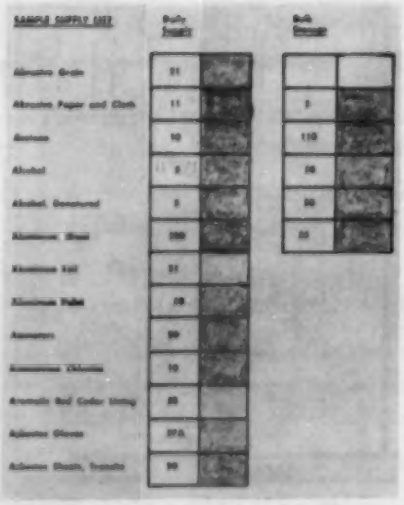


Fig. 1. Location of supplies — Comprehensive General Laboratory

This problem can be solved at least in part by a very simple chart known as *Location of Supplies* shown in Figure 1. It will take some time and effort on the part of the instructor to prepare such a list, but the time saved in class instruction is amply worth it.

To prepare such a chart, make a floor plan of your shop similar to the one of a comprehensive general shop shown in Figure 1. All the machines, benches, and storage cabinets are given numbers on the drawing. Each machine and cabinet is color coded on the floor plan

to correspond with the color coding of the tool boards in the shop, e.g., wood area is green; electrical area is red; graphic arts is black, etc., throughout the shop. Underneath this floor plan are hung 8½ by 11-in. cards listing alphabetically the tools and supplies in the shop. The first bears the following simple directions:

Supply List in the General Shop

How to use this list:

1. Check the list (alphabetically) for the material or tool you need.
2. You will find a number and color opposite the name of tool or material.
3. Look on the floor plan for the color you found.
4. Within the colored area you will find a number corresponding to the one you found opposite the name of the supply you need. This represents the location of the needed article.

Under this set of directions is found a complete supply list similar to the *Sample Supply Sheet* in Figure 1.

This not only saves the time of the instructor but it has considerable merit in that students, in getting their materials, come to know how such supplies are packaged and the various sizes and shapes in which such materials may be purchased.

Since all of our students are, or will become, users of consumer goods, how much more learning takes place along these lines by this method than for the instructor to put aside what he is doing and to simply hand them the required supplies.

A Hobby and a Project —

Manhattanville Fishermen

NEIL FARBER
Merrick, N. Y.

Manhattanville Junior High School is located at 129th Street and Amsterdam Avenue in Manhattan. There has been a school on that site for over a century, although the present building dates from the 1930's. The Hudson River flows a short distance away; but to get to it, you must cross Broadway under the El, pass assorted used-car lots, gas service stations, warehouses and wholesale meat-packing houses, and under the viaduct which is part of upper Riverside Drive.

Anyone going by the red brick school building of undistinguished architecture, surrounded by rundown tenements and rubble, would never suspect that it harbors young fishing experts. Yet in a corner of Room 330, Charlie Thomas' woodworking shop, there is always a small group of earnest boys busily planing, scraping, sandpapering fishing rods, and talking of striped bass, tomcod, and catfish, like so many Huck Finns, instead of city dwellers who hardly ever get a week in the country.

Charles J. Thomas, an instructor in woodworking, and the mentor of these youngsters, grew up in Hell's Kitchen, a poor section of Manhattan's lower West Side. As a boy he yearned to fish, but had no money for even the most meager equipment. So he made a surf rod out of an old pool cue, added a cheap dropline and a fifty-cent wooden reel. He's been a fishing enthusiast ever since (his gear having improved through the years, however). And since those early days he has fished all the waters on the eastern seaboard, from Maine to Florida.

Year after year, Charlie Thomas' boys win prizes at local and national exhibits for intricate wood inlays and a wide variety of professional-looking cabinetwork. Some of his pupils (he has been teaching for 32 years) have gone on to become shop instructors themselves. But he is especially proud of what he calls his "sideline" — a small club of boys who learn how to make and use fishing rods.

The members of the club fish on week ends and during school holidays and whenever possible during the summer recess. Not only do they fish the nearby Hudson, but they also travel up to Spuyten Duyvil, Riverdale and Croton, where they are occasionally rewarded with striped bass, eels, tomcod, catfish, and carp. At Coney Island, Rockaway Inlet, and Long Beach, Manhattanville Junior High School's fishermen have caught bass, weakfish, kingfish, blackfish, and fluke.

But to a 13- or 14-year-old city boy who wants to fish, getting started seems like an insurmountable stumbling block. Poverty, large families, broken homes, bad living habits, and limited horizons in a world of brick and asphalt are obstacles to any undertaking.

However, the contagious enthusiasm among the boys and help and encouragement from their teacher soon dispel all uncertainties. And many a boy in Charlie Thomas' fishing group has learned, for the first time in his life, to get to bed in time to get at least eight hours' sleep before an early start the next morning.

"Fishing on the New York riverfront, in particular at Spuyten Duyvil, is good from April on into December," says Charlie, "although in hot weather the fish go deep and are harder to catch.

"A dozen bloodworms or sandworms, which cost about fifty or sixty cents in a tackle shop, will last all day. The boys make up a couple of sandwiches for lunch, and walk down to the river wharf at the foot of 79th Street, near Marine Landing. The wharf has benches to rest on, and railings for fishing rods; and often the older men teach the youngsters how to bait their hooks and how to cast out safely. I've never heard of a boy who didn't become a confirmed fisherman once he lands his first fish."

For their fishing rods Charlie's pupils use greenheart or Cuban lemonwood. A surf tip begins as a 1-in. square, by 6- or 7-ft. piece; and this is planed down by hand to a ¼-in. taper. Three planes are used in the process — a block, junior jack, and jack; and about three hours of continuous planing and truing are required. The rod is then balanced, scraped, and sandpapered.

The next step is making the grip for the rod. It starts out as a piece of wood about 2 inches square and 8 inches long. Using gouge and calipers, the grip-to-be is turned on a wood lathe. To accommodate the shaft, a ¼-in. hole is drilled

completely through the grip. Then it is modified with turned beads and tapered to fit the shaft. After removing the grip from the lathe, it is glued on the shaft with waterproof glue, and the reel seat is fitted.

The rod's butt is made from hickory or rosewood stock, one and a half inches square. It is turned round, then put through the same process for turning beads as used for the grip. Then the other end of the reel seat is fitted and cemented on the butt.

Following Charlie Thomas' systematic directions, the boys file the guides on their ends to make a smooth joint for the silk windings which hold the guides in place. Next, the metal tip-top guide is fitted and cemented in place and held by cellophane tape until wound permanently with silk. Nylon silk, plain or variegated, is wound on the tip-top, on the guides, and where the shaft connects with the grip. Sometimes, for decorative value, the entire tip is wound. All silk windings are dressed with a thin lacquer to preserve the colors.

The entire rod, except its metal parts, is given a coat of thin shellac, and allowed to dry overnight. Finally, spar varnish, heated in lukewarm water, is applied by finger — to avoid brush runs — to wood and silk, but not to metal parts.

In the spring of 1944, only a couple of months after the first rods had been produced by members of the only fishing club in New York's giant public school system, two of Charlie Thomas' tyros chalked up a fishing record. The boys got their names and pictures in the newspapers after landing a twenty-pound carp with their school made rods. At any rate, this was a record for the Hudson River.

Charlie Thomas of Manhattanville Junior High School is looking ahead. "The fishing club is all boys now," he says, "but I'm working on our principal for permission to include some girls in the group, starting next September. If I can get the extra supplies, that is. If boys like to make fishing rods and use them, why not girls too?"

Learning Is Easier When it's Made More Pleasing —

Enjoyment for the Beginners

JOHN J. DeFOURNY
Crestview Junior High School
Columbus, Ohio

It is the purpose of industrial arts to teach beginning students the proper use of hand tools. This purpose can be achieved if there is a friendly and creative atmosphere in the shop. It is vitally important that along with the proper use of hand tools students be encouraged to develop creativeness. For the teacher to require one design for a project without variances is to repress student's individual differences and abilities.

In these days of crowded classes, an instructor can assign a choice of one or two projects to a class but he should encourage development in skill and design. Observe the wide range of imagination in the designs photographed of a group of 7th grader's outdoor signs. Each outdoor sign fulfills the function of the project as directed at the beginning of the semester: *"An outdoor sign must have numerals and designate the location of a house."* There is satisfaction and interest to the instructor to see such a variety of designs completed.

Besides encouraging individual creativeness this variety of designs permits an adjustment to individual skill and ability. Some boys being more physically developed or experienced with hand tools will progress at a rapid rate. These boys are encouraged to complete each step in accordance with perfect craftsmanship. The slower students follow the rules of craftsmanship but on their own level of ability. To require the slower students to continue to *square the ends* until there is no time left to complete the project is a disastrous introduction to industrial arts. In the minds of the boy and his schoolmates he has failed in the manly art of working with tools. He may avoid any further contact with tools in his lifetime because of this first unpleasant experience. Human beings of any age are just as sensitive about their capabilities with tools. Teachers should eliminate these frustrating situations by attempting to have each student finish his project by the end of the semester. More satisfaction is gained in industrial-arts experiences if the student may take home his project to receive the just acclaim of his parents. Let us not forget that these boys are beginners and in time with more experience will develop into better craftsmen but their first contact with industrial arts should be a satisfying one.

DIAMONDS IN THE ROUGH

Diamonds are an oil man's best friend — in tough drilling areas. Half-carat industrial diamonds are welded onto core drilling bits to give the tools more "bite." Some of these rock bits — veritable "Big Berthas" of the oil industry — are set with as many as 730 fairly uniform, half-carat stones, and cost over $3,500. Because of the expense involved, diamond coring bits are not used when another tool will do the job. The diamond core bit is a good example of the costly tools that oil men must constantly perfect to help them in their never-ending race to keep ahead of consumer demand for petroleum products. — *Petroleum Newsnotes.*

Of the nation's 67,000,000 persons in the work force, only nine million are skilled workers — not enough, says U. S. Labor Department Secretary James P. Mitchell.

Industrial Arts and Vocational Education

JOHN J. METZ, Editor

AN ANNUAL REMINDER

A CERTAIN percentage of our readers find it advantageous to change to a new school from time to time. Frequently, those who move forget to inform us of these changes. The result is, that the teachers who have moved to new locations, suddenly find that they are not receiving their INDUSTRIAL ARTS AND VOCATIONAL EDUCATION magazines.

We have discovered that schools often seem to neglect to send back mail addressed to teachers who have moved to new locations. Quite often, too, they are unable to give us the new addresses of the teachers who have left for new fields. Finally, after the elapse of three or four months, we get a request to replace missing numbers. Unfortunately, that is impossible since the cost of paper and printing make it necessary for us to make our press runs just large enough to take care of the circulation list, plus an allowance for those whose subscription is just starting after school opens.

May we, therefore, ask all of our readers to let us have their address for the new school year — not their summer address — at least by August 15, 1956. With this new address, remember to give us your old one also, and do not forget to add your new zone number.

ONE WAY TO DO IT

AT THE American Industrial Arts Association convention held in Milwaukee, student demonstrations by students from fifteen teacher education colleges were featured. The young men who put on this feature made an excellent job of it. Of course, they had to pay their own expenses, as do many of the others who attend these national conventions. This fact alone lays a heavy burden on those who do attend, and it is one of the reasons why many, who would like to be present at these meetings, must of necessity decide to refrain from partaking of the educational nourishment which these conventions offer.

Some of the young students who gave these fine demonstrations at Milwaukee came from points far west. They did not come by train nor by plane, but by more or less trusty automobiles.

One group, after traveling about one thousand miles, arrived in some town in Ohio, and prompted, no doubt, by the idea of economy, visited the mayor of the town. This gentleman recognized their need and promptly acquiesced to the suggestion that they be allowed to sleep in the town jail.

He did even better than that, for he had breakfast served to them in the morning.

One cannot help but feel that these students had profited from their study of problem solving at the teacher education college from which they came. They really are to be congratulated because they had received board and lodging gratis, but they also had a fine story to tell their schoolmates when they got home, and they set up a fine example of *where there is a will there is a way*, for those who think that they cannot afford to go to a convention.

Probably, however, their parents were not so proud when they heard the story, or didn't they? Be all of this as it may — those boys did a fine job with their demonstrations, and at least that part of their offering ought to be made part of more convention programs.

BOYS' TECH FIFTIETH ANNIVERSARY

ON JANUARY 2, 1906, the Milwaukee School of Trades opened its doors to train boys in the patternmaking, machinist and toolmaking, carpentry and woodworking, and plumbing and gas-fitting trades.

The Milwaukee School of Trades was started by the Milwaukee Merchants and Manufacturers' Association to equip young men with the skills and know-how required to carry on the manufacturing enterprises of the city.

F. W. Sivyer, William George Bruce, W. Read, A. J. Lindemann, and T. J. Neacy were members of the first executive board that organized the school.

Theodore Roosevelt, then president of the United States, speaking at the school, had this to say:

"I feel that it is important, from the standpoint of our common citizenship, that each man should be able to do a little more than pull his own weight in the world. It is, of course, of literally vital consequence to have him trained so that he begins early to pull that weight effectively, instead of leaving him to be trained haphazard, so that he learns to pull his weight three or four years later and not so well.

"That is what this school is doing. I feel that it is of utmost consequence to the boy in his profession in afterlife. . . ."

Charles F. Perry, who was in charge of the mechanical department shops, and assistant professor of machine construction at the University of Illinois, was appointed director and principal of the new school. Other men on the first teaching staff were: James L. Cox, assistant director and head of the drafting department; Fred Schoenig, head of the machine shop; Frank Sandberg, in charge of the cabinet and carpentry shop; Charles Jurach taught the pattern shop; and James Leadbeater, the plumbing shop.

The financial struggle to keep the school going was quite severe. Money had to be solicited to pay the expenses since there was no tax money available to take care of this.

In 1907 the new venture was taken over by the public school system of Milwaukee. Because of the need the school board at once doubled the machine-shop equipment and started other improvements.

On the last day of the year 1909 a fire broke out in the school and destroyed most of it, but this did not stop the work for long, as the school was at once transferred to an old factory several blocks away. In the meantime the school board decided to build on a greater scale.

In 1917, the school was organized into a six-year junior and senior high system. This covered the seventh to the twelfth grade. At the same time the trade features were retained. At this time, too, the name was changed to Boys' Trade and Technical High School.

In September, 1950, the Kosciuszko Junior Trade School was annexed to the Boys' Trade and Technical High School, thus enlarging the facilities greatly.

Milwaukee can justly be proud of this school and Mr. Fred Ziegenhagen, the present principal, is to be congratulated for the high standard of excellence which the school maintains.

The banquet on May 16 for which the Milwaukee Auditorium has been reserved will be the official celebration of the school's golden anniversary. It is an outstanding bit of publicity for it will accentuate to Milwaukee and the state of Wisconsin what this fine school has done in the past and what it is still doing.

The schools of this country are taken too much for granted, and it is well to make use of every occasion to demonstrate the excellent work that they do.

Problems and Projects

MAGAZINE RACK

GEORGE CARDINALE
Roosevelt Junior High School
Erie, Pa.

The seventh grade pupils in our woodworking shop some time ago constructed a magazine rack which offered them the opportunity of using and learning about a number of hand woodworking tools. The boys who built the magazine rack shown here used and learned about the following tools: crosscut saw, jack plane, flat chisel, wood mallet, coping saw, claw hammer, try square, one-foot rule, scriber, auger bit and brace.

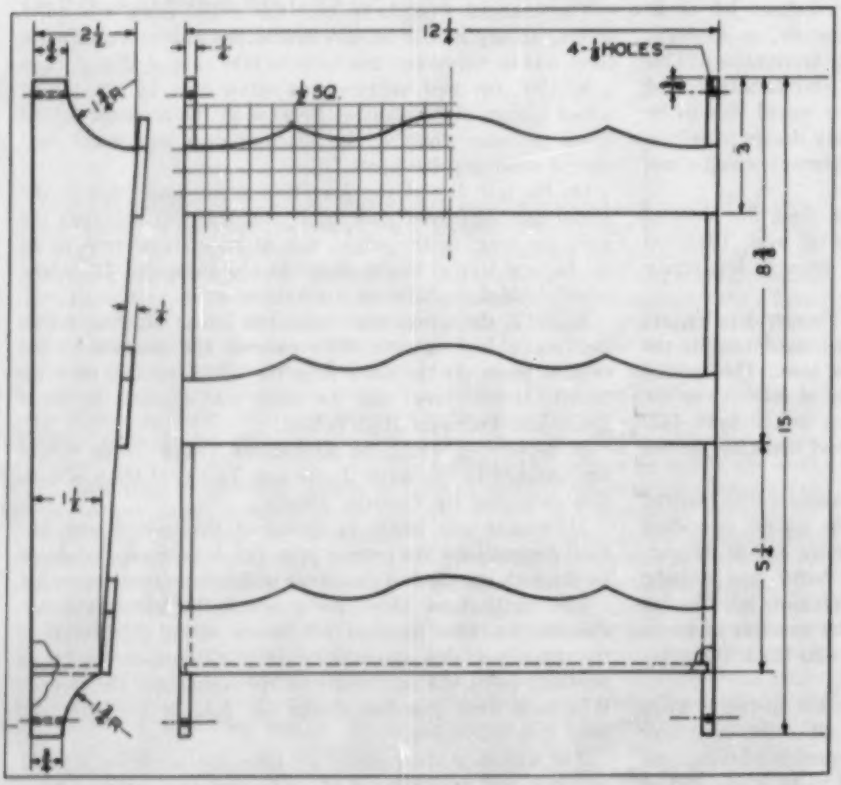
The rack is designed to fit against a wall surface or behind a door. It will hold a number of magazines and is certain to find a practical use in a boy's room.

The rack is easily built by junior high school pupils and will give them a valuable experience. Two joints are made in the project, the dado and the butt joint.

The project is finished with white or orange shellac.

The completed magazine rack

American factories and mines are producing 40 per cent more today than they did in 1946. — *Educational Press Association of America News Letter.*



Details of the magazine rack

DRAFTING TAPE STORAGE

ROY H. DUNGAN
Ambler Joint Junior High School
Ambler, Pa.

Have you made the change from *tacks to tape?* If not, perhaps you have noticed that after a few weeks of use, a new drawing board is soon covered with tack holes. Many mechanical drawing teachers have found that drafting tape furnishes a good solution for this problem.

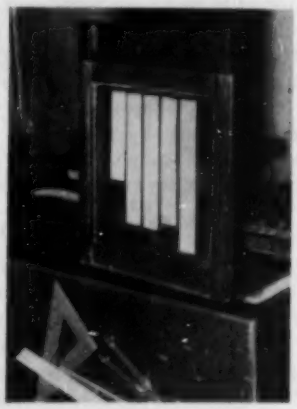


Fig. 1. Drafting tape attached to the glass, ready for use

The use of drafting tape for the securing of drawing paper to the board eliminates the many tack holes. This tape fastens the paper rigidly to the board. However, after a certain amount of use, the tape tends to lose its adhesive qualities and must be replaced. To the teacher, the replacing of used tape can become an irritating task. The answer to this problem lies right in the teacher's desk itself.

The typical desk contains one or two sliding boards. The procedure for converting one of these boards into a storage space for tape is as follows:

1. Remove the sliding board from the desk. This may require removing the desk top.
2. Lay out the area to be used for tape storage. It is recommended that this area extend across the entire width and have a length of 12 in.
3. Remove the wood from this area to a depth of one half the total thickness of the sliding arm. See Figure 1.
4. Smooth the entire area with abrasive paper.
5. Apply a finish that matches desk finish.

Fig. 2. Removing a piece of tape

6. Fit a piece of window glass into cutout space.

7. Secure glass into place with four strips of wood. These strips should be finished to match desk finish. The strips are fastened in place with small finishing nails.

To place tape on the storage space, fasten five or six parallel rows of drafting tape to the glass surface. A quick method for cutting the tape into small individual pieces is by using a single-edged razor blade.

When new tape is needed, the student merely pulls the sliding board out from the desk, lifts up a piece of tape with his fingernails, and removes the tape from the glass, as shown in Figure 2.

STEAK TENDERIZER

C. WAYNE CLOSE
Glendale School
Glendale, Ore.

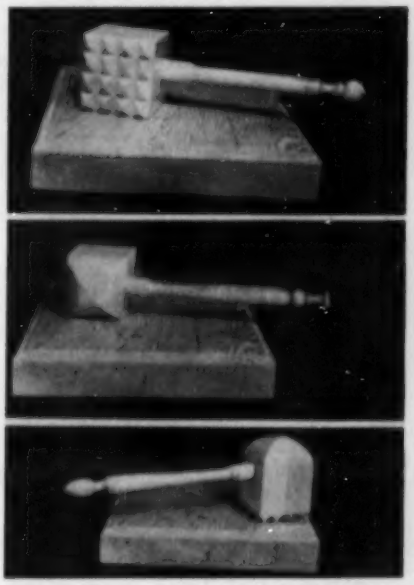
This simple little kitchen aid makes a good project to fill in the gaps between larger projects. It should require about 3 to 4 hours of construction time and can be handled by eighth or ninth graders.

Eastern rock maple is used because of its exceptional durability. Select a 3 by 3 by 4-in piece of this maple. Lay out the teeth on one end and the rounded contour on the other. Space the teeth carefully with dividers. The cuts are made with the band saw, although they also may be sawed out with a fine-toothed handsaw. Notice that the teeth are cut by sawing from two faces.

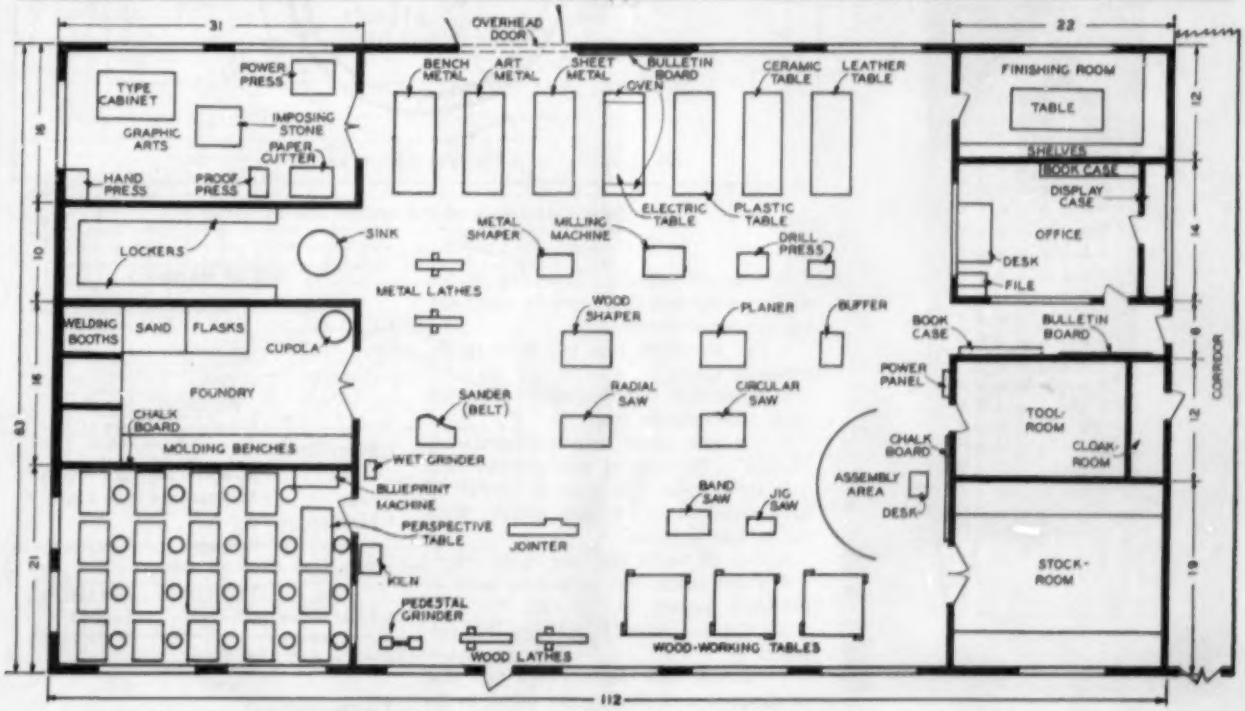
Bore a 7/8-in. hole into the head for the handle. Bore this hole about two-thirds through.

Turn the handle out of a piece of 1-in. maple dowel. Use high speed and sharp chisels to minimize vibration. The section of the handle which fits into the head should be very slightly tapered so it will draw tight when driven into place. It is well to try the fit before cutting off the end waste. For the final fit of the handle apply white glue and be sure the grain of the handle runs vertically for strength.

Finish with lacquer or salad oil and drill a hole in the handle end for hanging.



Three views of the steak tenderizer



Floor plan of the industrial-arts general shop submitted by Kenneth E. Dawson, assistant professor of industrial-arts education, Virginia Polytechnic Institute, Blacksburg, Va.

The several suggested designs for the handle can be used to stimulate originality. Indeed, each pupil could create his own.

CYLINDRICAL TV LAMP

LOUIS R. DERBY
General Metals and Machine Shop Instructor
Washington High School
Sioux Falls, S. Dak.

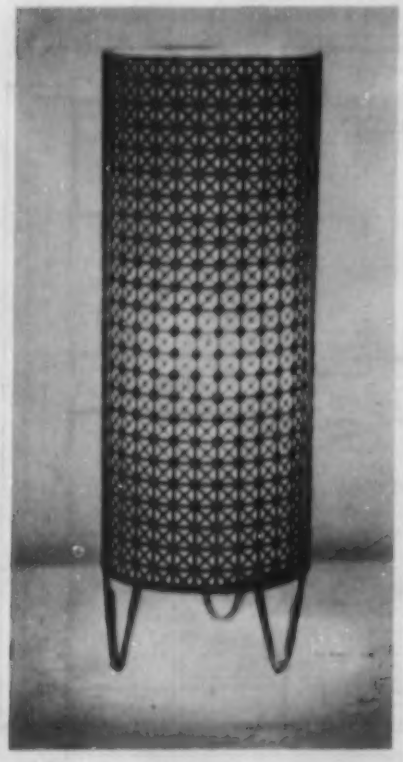
With many household items now being fabricated from wrought iron, this cylindrical TV lamp heads the popularity list in my metal shop classes. It is simple to fabricate and not too expensive.

Besides being a practical household item, it gives the student experience in layout, rolling, cold forming, drilling, and welding.

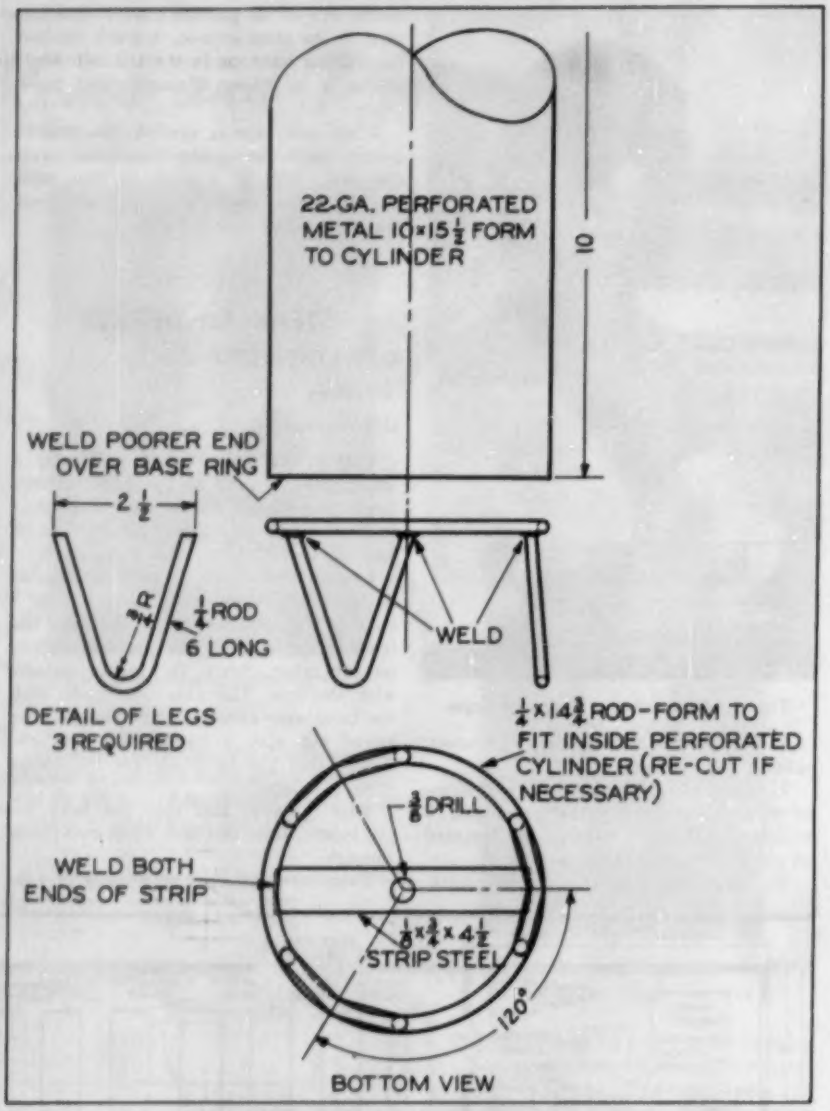
Any design of perforated or expanded metal may be used. With a piece of colored polyplastex (Fiberglas laminated in plastic) inserted inside the cylinder it becomes a very attractive TV lamp.

Fabrication Details

1. Lay out and cut perforated metal.
2. Form perforated metal in forming rolls and braze weld butt seam together.
3. Cut base cylinder ring and form in forming rolls to fit inside of cylinder. Weld this ring to cylinder so that it is flush with edge of cylinder. This ring is for reinforcement and also a base to which the legs are to be welded.
4. Cut the three legs and form to dimensions shown.
5. Space legs 120 deg. apart and weld on to base cylinder ring.
6. Cut light socket strip and round ends of strip to fit inside of base cylinder ring.
7. Drill ⅜-in. dia. hole in center of light socket strip for light socket. Weld the socket in place.
8. File all welds and any rough edges.
9. Paint entire unit with two coats of flat black enamel.
10. Cut and insert polyplastex into cylinder.
11. Attach light socket, cord and plug to complete unit. The socket listed, in the bill of materials, is a special socket for this type of mounting.



The completed TV lamp made of metal


22-GA. PERFORATED METAL 10×15½ FORM TO CYLINDER
10
WELD POORER END OVER BASE RING
2½
α
¼ ROD 6 LONG
WELD
DETAIL OF LEGS 3 REQUIRED
¼ × 14¾ ROD – FORM TO FIT INSIDE PERFORATED CYLINDER (RE-CUT IF NECESSARY)
⅜ DRILL
WELD BOTH ENDS OF STRIP
⅛ × ¾ × 4½ STRIP STEEL
120°
BOTTOM VIEW

Detail drawing of the cylindrical TV lamp

BILL OF MATERIALS

No. of Pcs.	*Name of Part*	*Material*	*Size*
1	Cylinder	22 gauge perforated metal	10 x 15½ in.
1	Base cylinder ring	Mild steel rod	¼ x 14¾ in.
3	Legs	Mild steel rod	¼ x 6 in.
1	Light socket strip	Strip steel	⅛ x ¾ x 4½ in
1	Cylinder lining	Polyplastex	10 x 15¾ in.
1	Light socket		Leviton No. 4055-1
1	Cord	Parallel lamp cord	6 ft.
1	Attachment plug		

CONSTRUCTION OF A SWIVEL CHAIR

GEORGE A. SODERBERG
Associate Professor of Industrial Education
Stout State College
Menomonie, Wis.
and
DONALD B. HOGAN
Industrial Arts Department
Muskegon Junior High School
Muskegon, Mich.

If the swivel chair at your desk is getting that "middle aged spread" which is dangerous to your life and limb, yet funds for a replacement may not be forthcoming in the near future — if ever — why not build yourself an easy, inexpensive, modern swivel chair that will put the original to shame.

All that you need for the project are the metal parts of a discarded swivel chair, lumber, upholstery material, and a finish to suit your own taste. The directions are as follows:

1. Completely dismantle old chair, keeping only the metal parts.

2. Study Figure 1 for construction of patterns.

3. Transfer the patterns in Figure 1 to stiff cardboard. Cut out patterns and transfer design to the stock to be used.

4. Band-saw the various pieces and smooth all sawed edges.

5. Build up flat stock. Back rest is made by gluing face to face several pieces of 2 by 6 by 22 in. pine stock to obtain a thickness of 12 in.

6. Band saw back rest. Refer to Figure 1 for shape of back rest. Transfer by pattern or by direct layout the shape of the back and band saw.

7. Bore two 1¼-in. holes 11 inches apart in underside of back rest to a depth of 2 in.

8. Trim back rest supports to fit 1¼-in. holes, leaving a shoulder on the supports. NOTE: If this fit is snug, it will not be necessary to glue this making it easier during the final assembly process. Figure 2.

9. Build up the seat. From 8/4 stock build up seat as shown in Figure 3. To underside glue an additional thickness of 4/4 stock for a total nominal thickness of 3 inches. This feature will give massiveness to the finished chair.

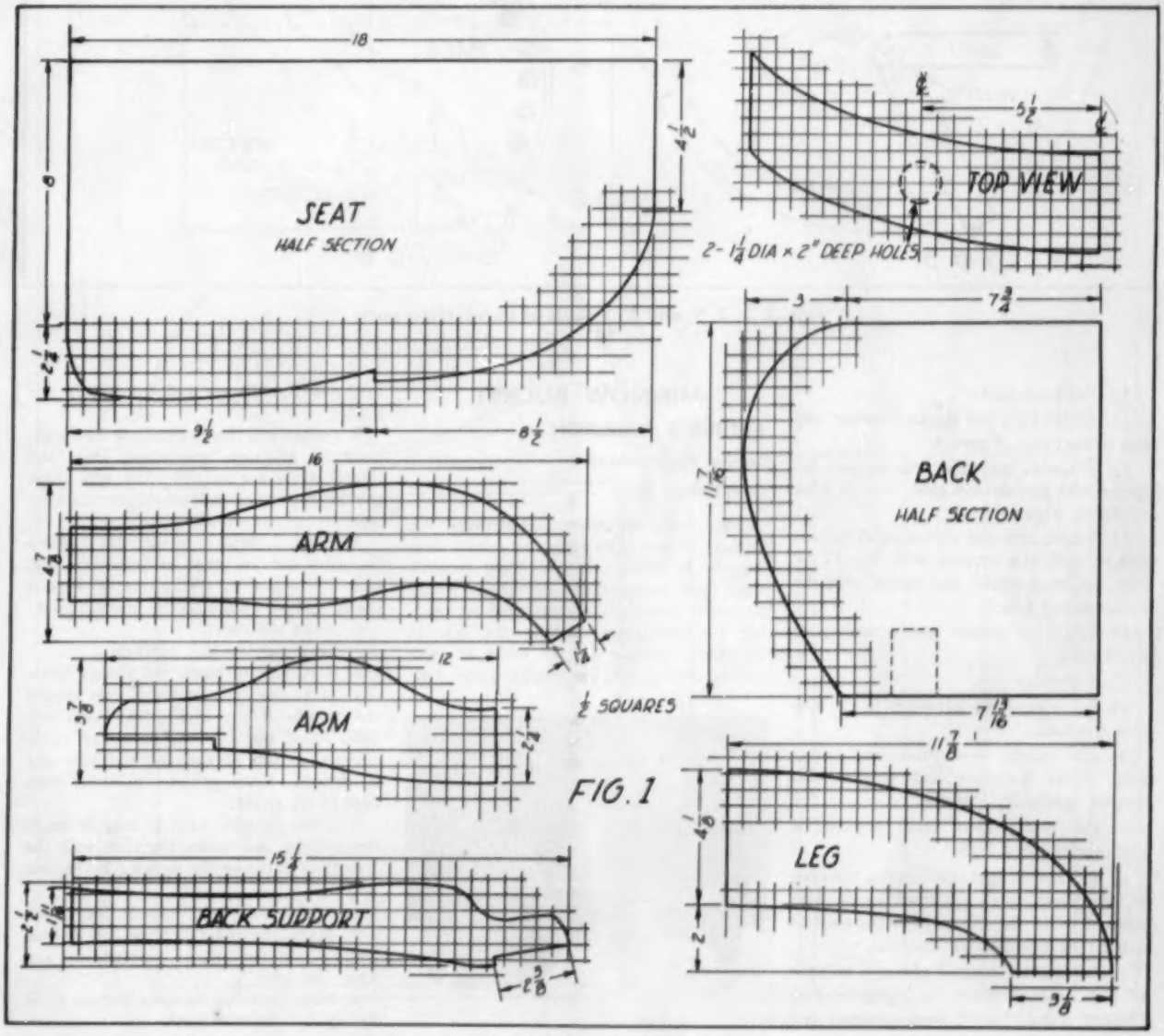
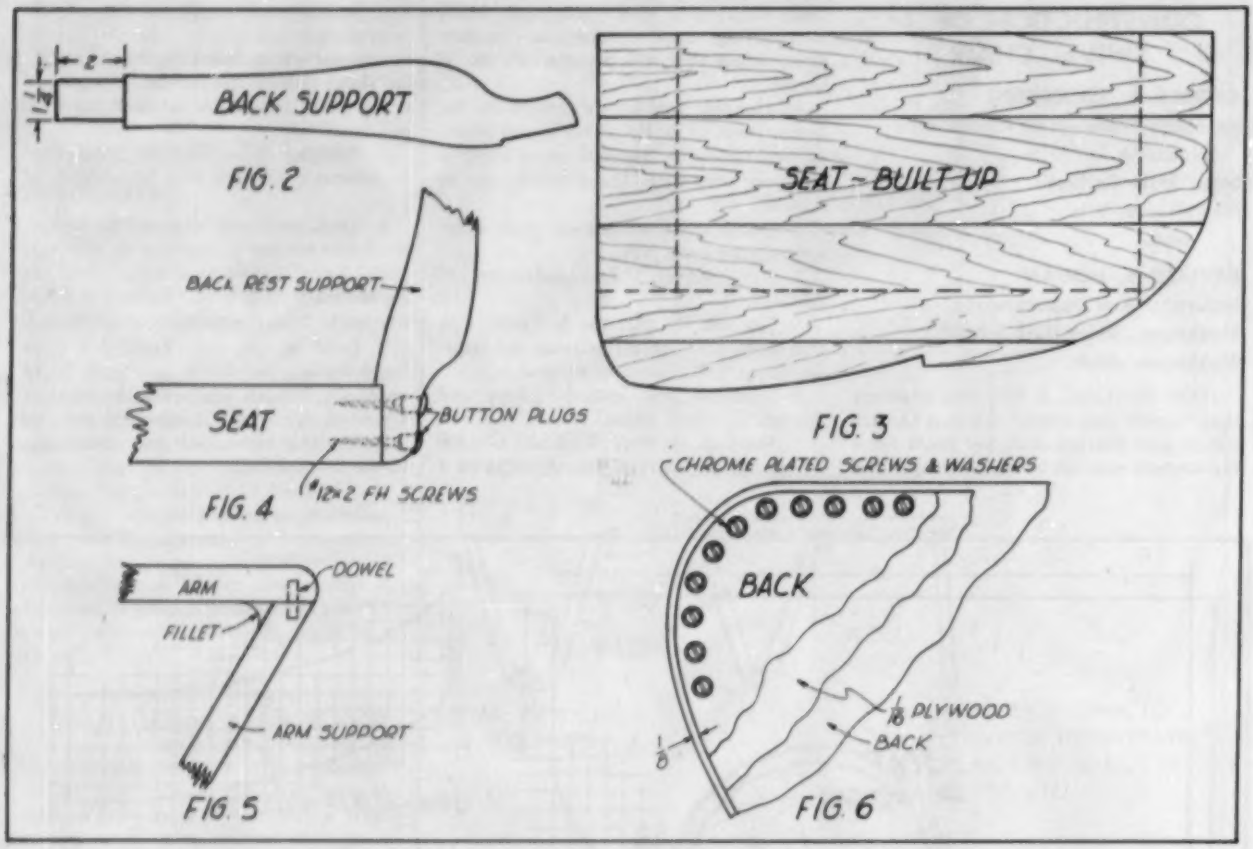


Fig. 1. Details of swivel chair parts



Figs. 2, 3, 4, 5, and 6. Details of swivel chair parts

10. Band-saw seat.

11. Secure back rest supports to seat and and to back rest. Figure 4.

12. Assemble arm and arm support together with dowels and glue. Glue in fillet as shown. Figure 5.

13. Secure arm and arm support to seat and to back rest support with No. 12 by 2-in. flat head screws and button plug the counterbored holes.

14. Finish as desired and according to wood used.

15. Upholster:

a) Cut rubberized horsehair to fit bottom and back.

b) Lay muslin over rubberized horsehair. Cover horsehair and muslin with desired upholstery material.

c) Cut from 1/10-in. birch plywood a piece the shape of back.

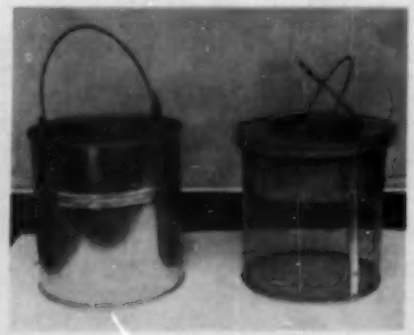
d) Cement or glue upholstering material to the 1/10-in. birch plywood. Color with paint or stain the edges of the plywood to match the upholstering material.

e) Secure this covered plywood to back of back rest as shown in Figure 6, with chrome plated oval head screws and washers.

MINNOW BUCKET

ARTHUR E. DAMERON
Senior High School
Galesburg, Ill.

Since boys are potential fishermen, the minnow bucket is an attractive school shop project. It meets the take home requirement and incorporates learning. Twenty or more operations are involved in reading the blueprints, making the bill of materials, figuring out an order of procedure, laying out the twenty parts, cutting out the pieces, and fabricating the bucket.

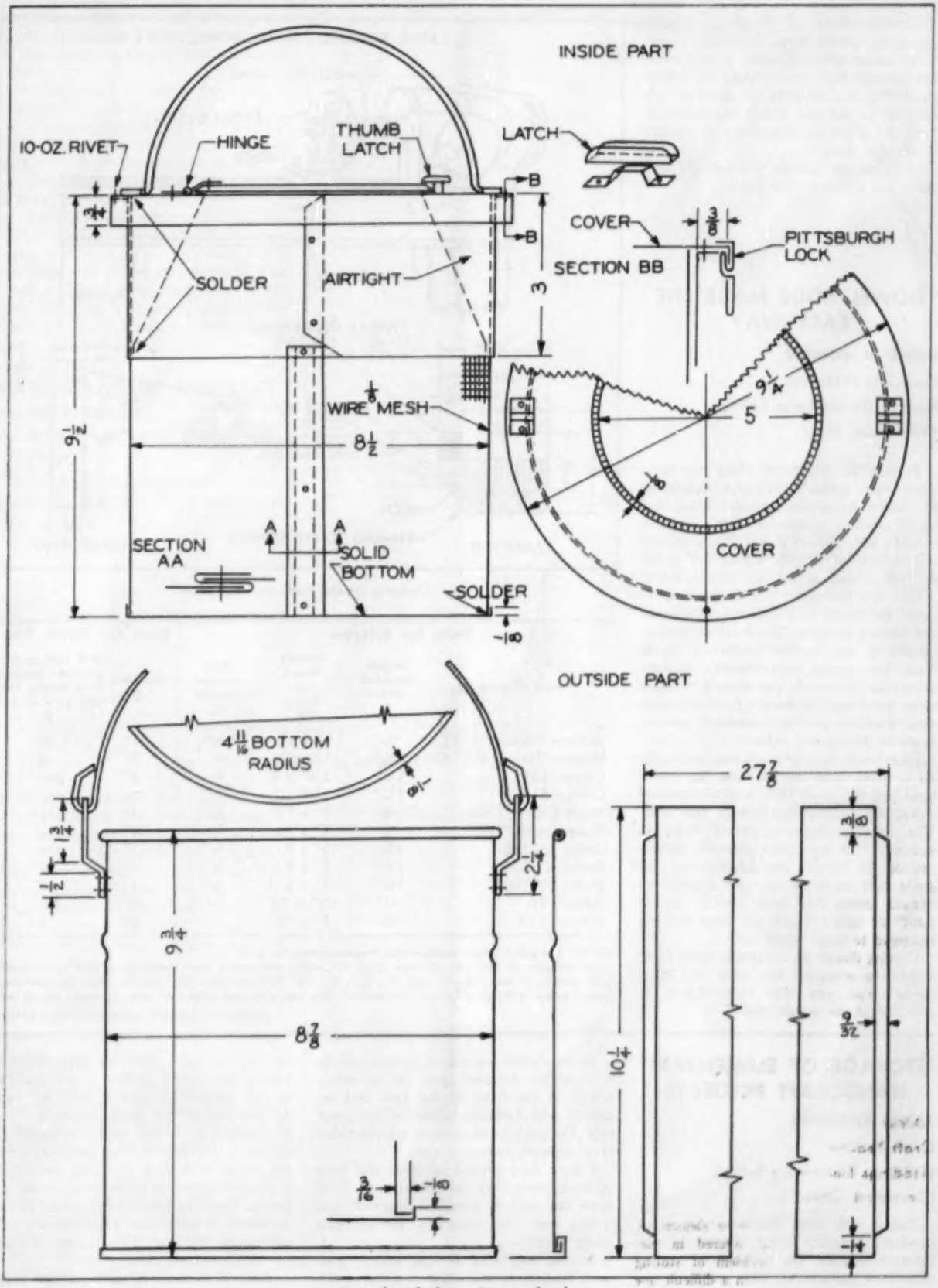


The minnow bucket

Materials and dimensions are optional; however 28-gauge galvanized iron and tinned rivets are suitable. The wire mesh should be either galvanized or stainless steel to prevent rusting.

Although I think it is well for students to figure out an order of procedure and have it checked by the instructor, here is the procedure we use on the inside bucket:

1. Make the cover.
2. Rivet on the bail brackets.
3. Rivet on lid hinge and thumb latch.
4. Make the cylinder which goes around the outside of the wire mesh. Form cylinder round and rivet the joint. Cut 3/8-in. notches on top of cylinder and turn out 90 degrees. Rivet cylinder to cover with four to six rivets.
5. Form the wire mesh to snug fit inside the cylinder and secure the ends with the S cleat as shown on the drawing by Section AA.
6. Solder the wire mesh to the cover.
7. Make the inner frustum of a cone which forms the airtight compartment and rivet lap joint.
8. Turn 1/8 in. of the cone bottom to fit flat against the wire mesh.
9. Put cone into place and notch the



Details of the minnow bucket

⅛ in. that extends up through the hole in the cover. Turn notches down and solder.

10. Solder bottom of cone to wire mesh and cylinder. Before completing the soldering drill a small hole in the cover or cylinder to let out air. Finish the soldering, then solder the air hole. This will insure an airtight float.

11. Form the bottom, slip over the wire mesh and solder on the inside.

DOWEL RODS MADE THE EASY WAY

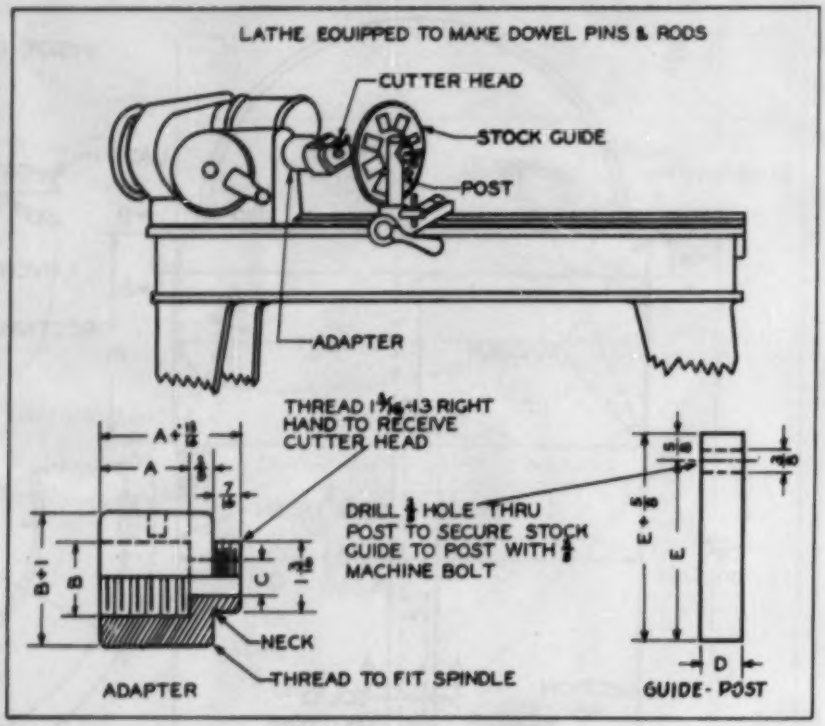
EWELL W. FOWLER
Associate Professor
Eastern Illinois State College
Charleston, Ill.

In machine woodwork there are occasions when students need large quantities of dowels of specific woods. Birch and maple dowels commonly are available through most industrial arts supply sources but dowels of certain woods are either difficult to find or are not manufactured.

One way to solve this problem is to make the dowels on a hand operated dowel rod turning machine. This method is satisfactory if only a few dowels are to be made but proves unsatisfactory if large quantities of dowels are needed. Making large quantities of dowels by hand operated machine is slow, tiresome, and of doubtful educational value.

Dowel rods may be made fast and easily on a wood lathe by adapting the cutter head and the guide from a hand operated dowel rod turning machine to the lathe. The drawing shows a wood lathe so equipped. The data sheet gives the specifications for making the adapter and the guide post necessary for such a setup on various lathes. Any lathe with a "hollow head" or hole through the head may be equipped to make dowel rods.

Cutting dowels on a variable speed lathe makes the operation fast, easy, and interesting. Also you may have dowels in quantity of the woods needed.


LATHE EQUIPPED TO MAKE DOWEL PINS & RODS
CUTTER HEAD
STOCK GUIDE
POST
ADAPTER
THREAD 1 5/16-13 RIGHT HAND TO RECEIVE CUTTER HEAD
DRILL ⅜ HOLE THRU POST TO SECURE STOCK GUIDE TO POST WITH ⅜ MACHINE BOLT
NECK
THREAD TO FIT SPINDLE
ADAPTER
GUIDE-POST

Making dowel rods on the lathe

Kind of lathe	Data for Adapter: Length threaded section A	Spindle thread, right hand B	Hole through adapter C	Data for Guide Post: Diameter D	Drill hole in post so that when post is in holder, hole will be over bed E
Walker-Turner L-953	25/32"	1" x 12	5/8"	1"	6"
Walker-Turner L-1152	25/32"	1" x 12	5/8"	1"	6"
Oliver 159	1¼"	1⅛" x 8	5/8"	1"	6¼"
Oliver 51	1¼"	1⅛" x 8	5/8"	1"	6¼"
Boice-Crane 1700	⅜"	1" x 14	¾"	1"	5½"
Boice-Crane 1701	⅜"	1" x 14	¾"	1"	5½"
Delta 46-230	1⅝"	1" x 8	5/8"	1"	5½"
Delta 46-305	1¾"	1" x 8	5/8"	1"	6"
Delta 46-310	1¾"	1" x 8	5/8"	1"	6"
Atlas 790	1"	¾" x 16	⅜"	⅝"	4½"
Atlas 7122	⅞"	1" x 10	⅝"	⅝"	6"

NOTE: For other lathes, make similar measurements for data. Make adapter of cast iron. If hole (D) is ⅝", make adapter of steel. Stock guide and cutter heads with cutters to make dowel rods ¼", 5/16", ⅜", 7/16", ½", 9/16", ⅝", 11/16" and ¾" may be purchased from Stanley Tools, New Britain, Connecticut. Use one cutter head for each size (diameter) dowel rod.

EWELL W. FOWLER, CHARLESTON, ILLINOIS

STORAGE OF ELEMENTARY HANDCRAFT PROJECTS

JAMES BASILONE
Craft Teacher
Giddings Elementary School
Cleveland, Ohio

Today, with more and more elementary handcraft courses being offered in elementary schools, the problem of storing unfinished projects has been a difficult one to solve.

In the elementary school, project storage is somewhat different from the secondary school in the light of the fact that we usually lack facilities to do the job properly. The projects themselves are somewhat of a different type and size.

I have used several methods and none of them were very successful until I hit upon the method described herewith, and it has been very successful for the past seven years.

At the beginning of the school year, each student in the class is given a 25-pound paper bag and his name is printed on one or both sides for identification. During the time a student is not working on his project he puts it into his bag. At the end of the work period his bag is collected by a boy who is assigned to this duty. The bags for this particular class are placed in a large fireproof box which is marked according to the grade, room, or period. Then the large box is placed in the storeroom or some other place where it will not be in the way. This system is used for each separate class.

When it is time to pass out the bags, the bag passer simply looks at the name

on the bag and distributes it to the person named without any difficulty. Incidentally, the bags should be sprayed with a fireproof solution.

The bag system eliminates the following problems:

1. Lost projects or parts of projects.
2. A boy erasing someone's name from a project and placing his own on it.
3. Time element in collecting and distributing of projects.
4. Disorderly or untidy storage place.

After a project is assembled, it no longer is put into a bag, but is placed on a large table with the owner's name on it so it will not show after the project is finished. The project is also placed on this table once it is varnished, shellacked, or painted for display.

PARABOLAS IN ABSTRACT

WALTER P. BUSCH
Woodrow Wilson Junior High School
San Diego, Calif.

The parabola is a beautifully symmetrical curve. They are all the same shape and differ only in size. This curve is used in making lenses for telescopes, searchlights, road sections, bridge arches and the king of all bridge types, the suspension bridge. The inspiration of a young mechanical drawing student can be aroused by introducing everyday achievement as examples of work completed by using the methods and skills the student may be learning in class.

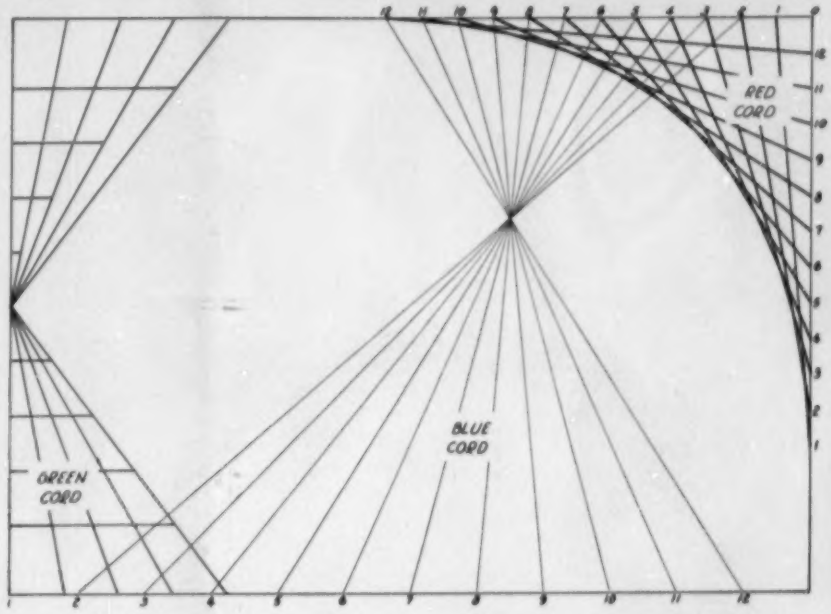


Fig. 2

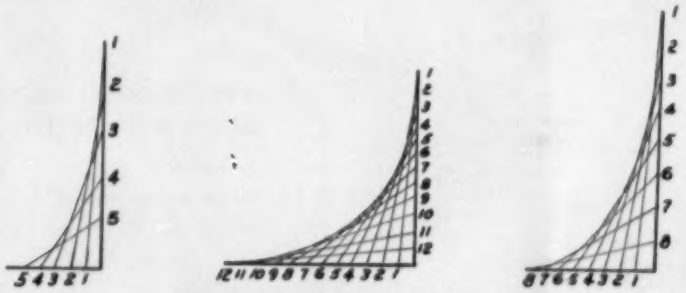


Fig. 1. Parabolas in abstract

The history and sizes of telescopes used at observatories such as Yerkes Observatory, Mount Wilson Observatory, Lick Observatory, and Hale Observatory, Palomar Mountain, California, offer examples and related information as to why the parabolic curve is used. This background may create an interest in the field of astronomy while teaching mechanical drawing through the related information contribution. We know, of course, that the parabola is studied mathematically in analytical geometry but we leave the technical equations for college study and demonstrate only their characteristics. To study suspension span and history of the accepted type for long-span construction of bridges we need to study John A. Roebling who came to New York in 1867 to design and build his world famous bridge — the Brooklyn bridge. The Brooklyn bridge held the record as the longest suspension span for 20 years. Then the following bridges surpassed this span:

Williamsbury Bridge	1,600 feet
Bear Mountain Bridge	1,632 feet
Delaware River Bridge in Philadelphia	1,750 feet
Ambassador Bridge at Detroit	1,850 feet
George Washington Bridge	3,500 feet
Golden Gate Bridge	4,200 feet

The Messina Straits Bridge now being

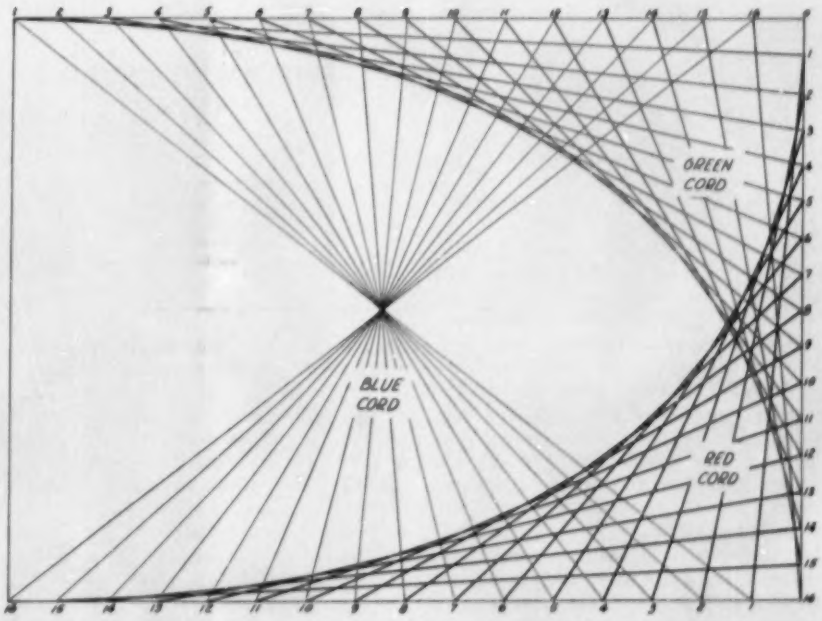


Fig. 3

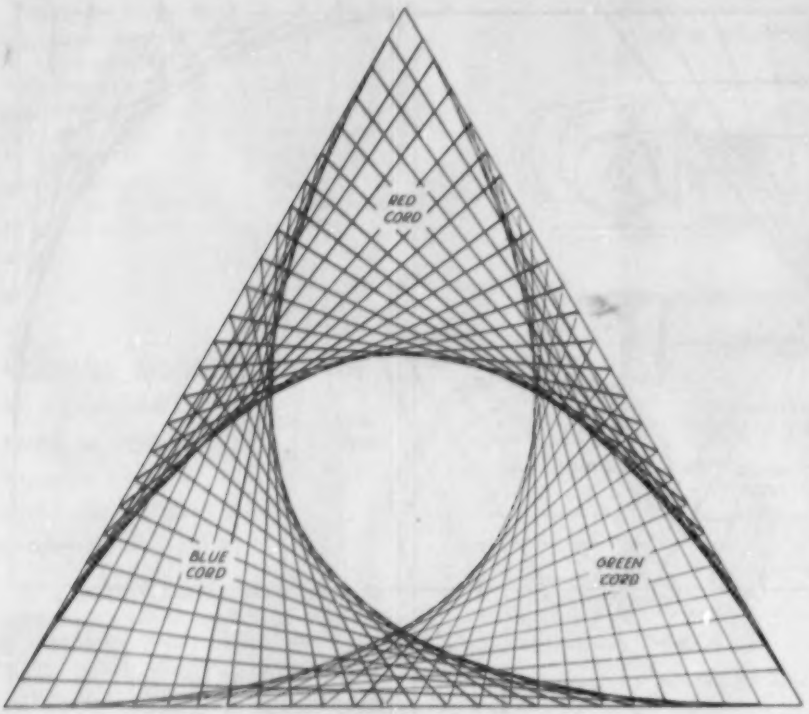


Fig. 4

planned, will cross between Sicily and Italy, and is to be 5000 feet between the towers. The new science of bridge design brings creativeness, imagination, and an expression of aspiration to young students when they know they may aspire to such accomplishments. The skill in mechanical drawing has been emphasized for a long time at the expense of imagination and creativeness. Accuracy is necessary and techniques must be learned but most important is, "what is the student thinking about while he is drawing; is he creating while he is drawing or is he just completing the drawing on the next page for the teacher so that he can turn it in for a grade."

In the area called geometrical construction or applied geometry the use of instruments and how to construct geometrical problems, we find the conic sections, and one of these is the parabola that can be taught to young students of mechanical drawing by the parabolic enevelope method. Many problems in machine design are worked out by this method wherein the base of a problem may be stepped off into a number of units and the vertical area into the same number of units although not the same distance apart. Here is where the teacher can introduce, "How to divide a line into any proportional parts." Number these units or steps in the layout shown in the figure below and connect the corresponding numbers. The tangent curve will be a portion of a parabola.

Near the beginning of a new semester in mechanical drawing the writer asks his students to check basements, attics, garages, and used furniture dealers for picture frames that may be used as a final problem in applied geometry. The students are encouraged to lay out many patterns and designs of parabolas on wrapping paper cut to the size of the opening of the frame selected to use for the final parabolic abstract. When the design has been chosen, supplies such as tacks and art board of flat colors that will harmonize with the colored cord should be issued to the students, and a modernistic problem in abstract is being made for the home. Some students choose to have the back open if the wall background furnishes good harmony with the cord and frame.

From the pencil layout points are to be placed on the picture frame where tacks will be driven in with a magnetic hammer as shown in Figures 5 and 6. Some students choose to mark off the art board and punch holes with an awl and *sew* the cord on the colored chip board.

Complete the frame with screw eyes and wire and a finished problem goes home from mechanical drawing that is modern, artistic, has beauty of lines, grace of proportion, and will have harmony of color.

The parabola in abstract gives the student his first experience of design in curves other than the circle and he cannot remain unmoved at the sight of a beautiful bridge or observatory because this experience has taught him to appreciate those beautiful curves that were once an engineer's dream and then a drawing.

BULLETIN BOARD—PROJECT WITH A PURPOSE

MICHAEL RHEA
Pacific Beach Junior High School
San Diego, Calif.

Most industrial-arts instructors teach other values besides the subject matter of the classroom. They teach efficiency, neatness, and orderliness through organized cleanup schedules, distribution of supplies,

Fig. 5. Tying in the cords to the tacks on the frame
— Photos, courtesy of San Diego City Schools

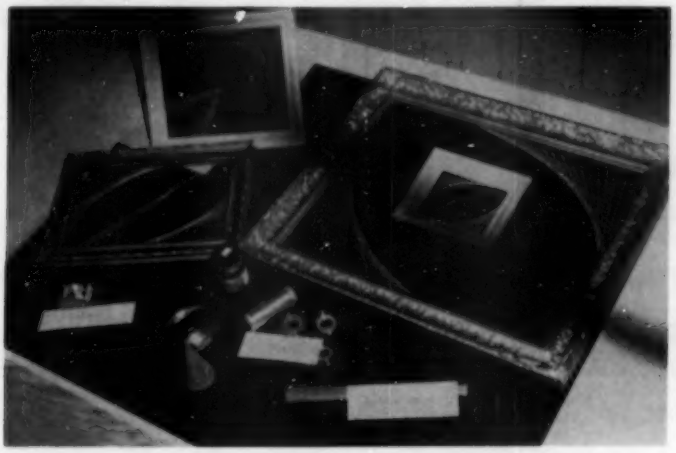


Fig. 6. Supplies and example of making and framing abstract parabolas

orderly tool panels, etc. The majority of students naïvely sense these qualities, and express their recognition in the unsophisticated, eager co-operation they display. What shop teacher has not heard words of disappointment from students who did not get an opportunity to be a shop foreman or stockroom clerk during the past semester. This is especially true on the junior high level. Why not recommend to the students a project that would help them acquire the means for developing and learning more efficiency at home.

A small bulletin board would make a worth-while student project for a boy's room, workshop, or in the kitchen for the entire family to use. There are countless ways in which a board such as this may be utilized to promote efficiency. Appointments could be pinned on it, letters to be answered, magazine and newspaper articles of family interest, and perhaps a sketch or picture of a contemplated project. The bulletin board, as a project, could very likely stimulate much student interest because of the personal use they would anticipate from it.

There is a certain amount of challenge involved considering that accurate miter and rabbet joints are necessary for square corners and a general appealing appearance. The frame can be of inexpensive wood, and stained or painted to harmonize with the decor of the room where it is to be used. Cellotex, or a similar material, is suitable for the backing of the frame on which to pin the bulletins. The size is a matter of individual choice, however, careful consideration should be given to avoid making the frame appear too large and flimsy. A good suggested set of dimensions that are in proportion to most walls are listed below.

Over-all 36 by 22 in.
Thickness ¾ in.
Width 1¼ in.
Rabbet joint ½ by ½ in.
Celotex 35 by 21 in.

The home bulletin board in use

A NEW BAKELITE PRODUCT

A new material, called Synrock, is a solid foam of Bakelite phenolic resins that has almost no grain. Simple hand tools cut smoothly and cleanly through blocks of the foam to form a unique new texture for vases, bowls, trays, desk sets, and other useful items. A quick-drying finish seals the surface pores of this unusual foam material to give it an appearance similar to carved stone. The V. L. Smithers Manufacturing Company, Akron, Ohio, developed this material for handicrafts.

Ordinary chisels, knives, files and saws with cutting edges kept sharp can be used to shape the new material. Power tools such as drill press or lathe may be used also for turning a vase. The outside and inside surfaces of the vase are shaped with a chisel. Then these surfaces are sandpapered to the desired smoothness, after which the fine dust is removed from the pores with an air jet, vacuum cleaner, or slapping with a rag. Several coats of a clear, fast-drying finish are brushed over the carved surfaces to seal the pores against moisture. This sealer also serves as a strong adhesive for joining carved pieces of Synrock together. Varnish, shellac, and any other paint, lacquer, or enamel will coat Synrock without softening its surface.

A NEW USE FOR GALLIUM

Gallium, a long available but seldom used wonder metal, today has a promising new application as a sealant in the many glass joints and valves in laboratory vacuum equipment.

The novel use for the 80-year-old metal was discovered at the East St. Louis, Ill., works of Aluminum Company of America's refining division. It makes possible the redesign of vacuum equipment to afford simplification and lower cost. In a recent experiment performed by Alcoa's research staff the effective operating time of a tapered ground glass joint was more than doubled by the metallic gallium sealant.

The successful application of the metal that melts in one's hand, and boils at a temperature exceeding 3500 degrees F., promises to reduce operating costs by eliminating repeated dismantling of retorts and tubing to clean and re-seal leaking joints. Intricate equipment can be operated efficiently when gallium is applied to simple, low cost, smooth glass joints.

Gallium becomes a liquid at 86.5 degrees F., and therefore, is easily inserted in the joint sleeve, where it clings instantly to the glass surface. As it cools to room temperature, gallium again becomes solid and expands, forming a perfect seal. Its low melting point also simplifies subsequent equipment dismantling and reassembling.

OIL STEELS ITSELF FOR RECORD YEAR

"Steeling" themselves for a record-shattering drilling program in 1956 will be more than just a figure of speech for the nation's oil producers; it will require a tremendous amount of metal. An estimated 56,000 to 58,000 wells will be drilled this year. The typical 10,000-foot well requires at least 450 tons of steel for rig, drill pipe, and casing alone. Just as oil is one of steel's best customers, oil serves the steel industry in many ways, too. It provides billions of gallons of fuel and lubricants for the intricate machinery of the mammoth steel plants. — *Petroleum Newsnotes.*

Because the Spanish-speaking population of New York City is increasing, the board of education thought it'd be good for city policemen to know the rudiments of the language. School officials announced a course in Spanish, expecting "two–three dozen" policemen to respond. No less than 1,125 policemen applied! — *Edpress News Letter.*

Project Design in the School Shop

ALEXANDER F. BICK
Teacher in Milwaukee Schools
The Milwaukee Downer College
The Stout State College, Summer Session

As a summary of the articles in this series, the writer wishes to offer the following:

1. The contemporary professional industrial designer's concept of project design is the criterion toward which we strive.

2. Design in its best form radiates a cleanness, strength, honesty, finish, and authority, felt alike by students and adult citizens, much as a fine model car radiates refinement to the senses of schooled and unschooled observers alike.

3. The recommended professional type of contemporary design in the shop is closely allied to the superior purposes of the shop, just as the potential of industrial arts and the superproduct of the shop are inseparable from the ideals of the age.

4. The industrial designer's professional understanding of socially esteemed product design is the teacher's personal criterion for his own attainment in the understanding and use of design in the shop. Nothing short of this level is worth his time.

5. Professional source material alone is contact material for the teacher.

6. The tendency in teachers to avoid design in the shop or to shunt the subject to a lesser category in the teaching scheme is due to a subtle fear, bred of a never satisfied searching for clarity in the area of design and the consequent mental confusion in the presence of a demand to teach it. However, it is encouraging to know that systematic contact with design of a high order allays fear, and clears the way to realistic understanding and eventual mastery of design, and the satisfaction of teaching it with authority.

7. A teacher may train himself, since he must now teach without benefit of having been taught — and should he not train himself when the training is simple and enjoyable?

a) Training consists of systematic and faithful study of well-designed products. He merely pages through professional journals at first, absorbing from each month's issue as much as he can take of the professional philosophy trying to understand the reason for the forms of the various parts, finding by contact what is typical and what is not. This can be learned only by studying and observing long enough and willingly enough, but the process is not without great satisfaction.

b) Training continues and is accelerated through sketching: copying at first but not for long; creating new forms in the spirit of the professional view: changing table top shapes to new shapes and to desired uses, changing leg types, designing cases as they are visioned professionally, etc. Practicing, in other words, is a process of self-education, and by it, together with the continued professional contact, correct forms and systems become familiar.

8. Designing with the thought of using new materials is an important step in the advance of contemporary thinking.

How Important Is Design?

This is a familiar question. Teachers say "We are pressed for time: we have all we can do: we can barely cover our mechanical essentials in the allotted time: not another subject, please!"

Design is not another subject. It is the spirit of the basic subject itself; the most potent tool in the hands of teachers to draw out of students the superproducts of industrial arts which are inner resources and individual purposes in students, and the mental pictures of construction that together with skills build the "man," the *builder* of the age, the matured and balanced citizen of a new era.

How Is Design a Tool?

Design of projects is the means by which teachers may refer to its relationship to *Building a New Renaissance in America*. It is the opening by which the phenomenon of present contemporary industrial, commercial, and architectural design — cars, pens, new furniture, new homes, and industrial products — may be made alive through the industrial-arts course.

A practical step-by-step process in an approach to design is given below. The inspiration may vary, but the general process of thinking through the problem, will be found to be typical of project design as a whole. A metal shop project is taken as a subject. To simplify the directions, brass is to be used alone, though the items could well be composed of a combination of materials such as brass and wood, or brass and plastics. This would

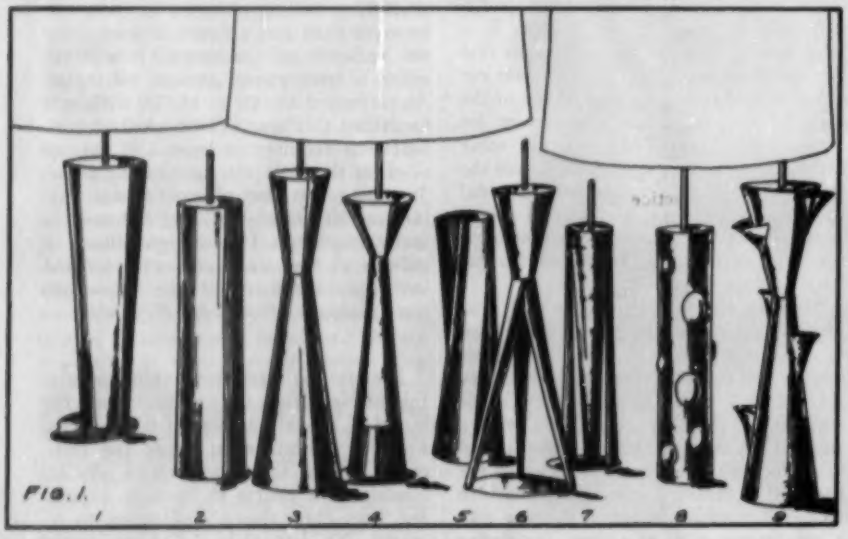


Fig. 1. Designing a lamp

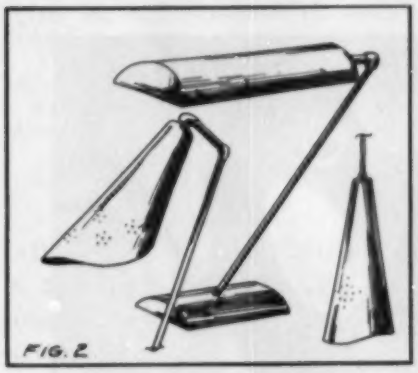


FIG. 2

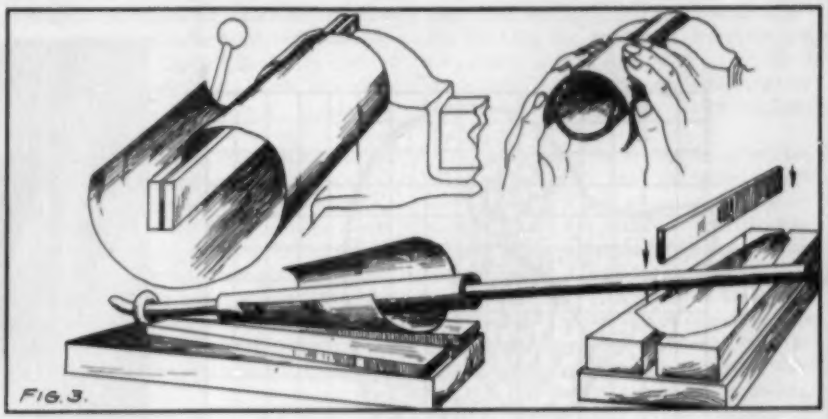


FIG. 3.

broaden the scope of the lesson, combining materials being typical of the present trends in design.

1. The first and inspiring thought — a supply of 22-ga. sheet brass — what to do with it.

2. What processes should be taught? Layout, cutting, bending, soldering.

3. What style project and what type of processes? Obviously, the work should take the most recent contemporary form, and be constructed by using the most recent methods. This bars hammering and other metal torture, and it involves smooth, simple bending by means of which there should result objects that produce a feeling of cleanness, honesty, and frankness besides giving the project strength and dignity in addition.

4. Typical projects for this approach might be a lamp, a candlestick, a book end, or a desk lamp and shade. See Figures 1 and 2. All of these articles to be made without seam soldering, i.e., all to have frankly open seams. Classes have liked these projects.

5. What forms may be obtained by mere rolling of metal? Cylinders, cones, truncated cones, and struts.

6. What treatment shall these forms be given? To fit the forms to the age, a certain familiarity with what is being done with similar articles is necessary in order to be free to express the idea in question with confidence and in the spirit of professional thought.

Paging through late issues of professional source magazines such as the *Interiors Magazine* or others of its level, would be in order at this point; or, having been in the habit of paging through such sources for a year or more, the feeling for contemporary form would have been built beforehand. In any case, the result of such application is to be seen in the illustrations. At first, the forms are simple structures consisting of cylinders and truncated cones serving as frank expressions of their function: holders of light. Light posts are the pure function. In further development, liberties are taken with seams, being left open, item 5, Figure 1, and struts are added to the structure as supports, items 6 and 7, still being functional; and last, points of interest are added in items 8 and 9, Figure 1. The additions being unfunctional and detracting, they make the design decadent. If a decoration is applied merely to make the object "different," and if it has no obvious function, it is wiser to avoid using it. To design a project for its frank function is best in the end.

However, the difference between pure engineering (design for use) and industrial design, items 1, and 3 to 7, Figure 1, is that the latter expresses *use* in its pleasant way, rendering it useful and beautiful at the same time. A design is not fully functional until it is both useful and aesthetically right, for the commodity must be pleasant to use and for this reason, it must appeal to that endless inner quality in man that is ever sensitive to more and more of itself in its environment. This quality is inseparably related to right proportion, (its parts not just divided in half), newness of expression (fresh ways of forming the parts or of combining parts), and simplicity and cleanness of expression. This lends serenity and dignity as well as strength to the design. New design is unafraid and frank in its statement of a function, and it needs no embellishment to give it this honesty.

Figure 3 shows three solutions to the hand-bending problem, machine bending being impractical except in one case. The project is an excellent one for the class to make its own jigs, a few of which are shown; and to practice *quantity production* whenever possible.

Assembly is by soldering over a flame, each lamp having a top and bottom brass plate. The top plate is provided with a 3-in. length of threaded pipe held with lock nuts, this being complete before soldering. The *hourglass* types are provided with a center plate to facilitate holding and soldering during assembly.

The legs of item 6 and the struts of item 7, Figure 1, are bent to U section in the jig shown at the right in Figure 3. The blank is set over the slot in the jig, as shown, and by means of a hammer or press, the metal bar illustrated above the slot drives the blank into the slot, completing the leg. Slot and blank should be planned so that the article comes out of the operation ready to solder.

At the completion of all soldering, the metal is scrubbed with steel wool charged with pumice or kitchen cleanser; then dried, and lacquered.

Finally, even the barest amount of design in a class needs introduction, so that all subsequent reference to it has meaning. Therefore, it should be found, as one of the late articles in the series pointed out, that a well-organized initial introduction during the first class lecture of the semester solves most of the industrial-arts design problem, that is, if this lecture is followed, either casually or intentionally during ensuing sessions, with suggestions and exhibits that lead to final understanding. Thus design is taught to students without loss of class time, and with a thoroughness that comes naturally through association with design.

DOG DOORSTOP

CLIFFORD L. YARD
State Teachers College
Millersville, Pa.

BILL OF MATERIAL

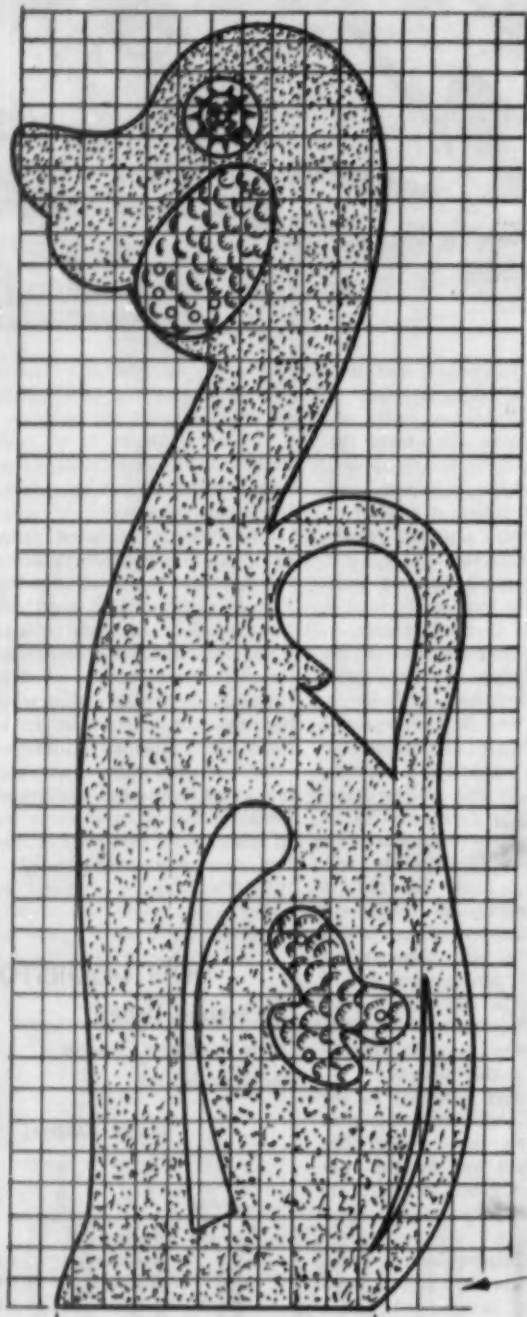
No. of Pcs.	*Name of Part*	*Material*	*Size*
1	Body	Tempered presdwood	⅛ x 4 x 11 in.
1	Ear	Aluminum	18 ga. x 1 x 1¼ in.
1	Flank	Aluminum	18 ga. x 1¼ x 1½ in.
1	Eye	Aluminum washer	18 ga. x ½-in. dia.
1	Eye	Brass upholstery tack	½-in. dia.
1	Base	Mild steel	18 ga. x 2½ x 5¼ in.

Construction Notes

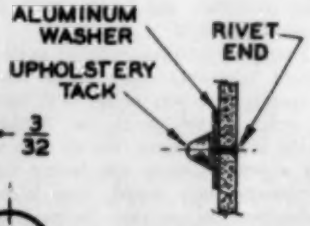
Copper, brass, or nickel silver may be substituted for aluminum.

The body may be made of plywood.

The marquetry technique may be used with veneer or cork.



SECTION THRU EAR



SECTION THRU EYE

Details of the dog doorstop, and the finished product

The dog may be made of contrasting colored plastics.

A slot sawed in a ¾-in. dia. steel bar makes a good bending jig for the base.

Peen the metal ear on a lead block; then dome on lead block.

TELEVISION DEMONSTRATION BOARD

S. T. McNeal

Orange Coast College

Costa Mesa, Calif.

An effective training aid used in connection with the vocational electronics classes at Orange Coast Junior College has been the television demonstration panel shown in the accompanying illustration. Built as a class project in 1952–53 the unit has operated without failure for a full year, even though it has been transported in passenger cars, and subjected to considerable vibration. The unit satisfactorily receives all seven V.H.F. channels available in this area with any single bay outside antenna and receives most channels simply using the 300 ohm ribbon dipole stapled to the wood framework of the board. Since Orange Coast Junior College is located 40 miles from the Los Angeles transmitter sites, the sensitivity is adequate.

This unit is built around the Techmaster 630-D-24 television kit which incorporates such refinements as keyed A.G.C., horizontal A.F.C., and Cascode tuner the cost of which is relatively high. While this gives the advantage of all new parts, another alternative, of course, is to use an old chassis carefully disassembled and rebuilt. Still another alternative, and one with much merit, would be the construction of a panel to correspond with the basic circuits as described in the textbook used for the course. Such circuits are often simplified with few refinements. Such a unit might, therefore, be of more teaching value than this more complex unit, provided one could tolerate the poorer receiver performance that would, no doubt, result.

In planning the unit it was decided to place the ten sections of the receiver in about the same positions that they are found in the most-used circuit schematics. The size required for each section was determined by making a full-size drawing, having the parts at hand to be sure parts and the drawing could be accommodated in the space provided, and then juggling result to fit the full rectangular panel.

Approximate sizes of the sections thus determined were: total panel size: 34 by 48 in.; tuner: 9⅝ by 17⅛ in.; low voltage power supply: 9⅝ by 17⅛ in.; sound I.F.: 8¼ by 20 in. A.F. Amplifier: 8¼ by 17⅝ in. picture i.f.: 8⅝ by 16¾ in.; video amplifier, 8⅝ by 20¾ in.; synchronizing section: 8⅝ by 16¾ in.; vertical deflection: 8⅝ by 20¾ in.; horizontal a.f.c.: 8¼ by 15¾ in.; horizontal deflection and h.v. power supply: 8¼ by 21¾ in.; these dimensions provide enough clearance for the hardwood framework which encloses the panel.

The panel material is .064 in. aluminum sprayed first with zinc chromate primer and next with a dull white finish. The resulting surface was found to be satisfactory for use with standard drafting instruments and india ink. A final lacquer spraying to prevent smudging completes the finish.

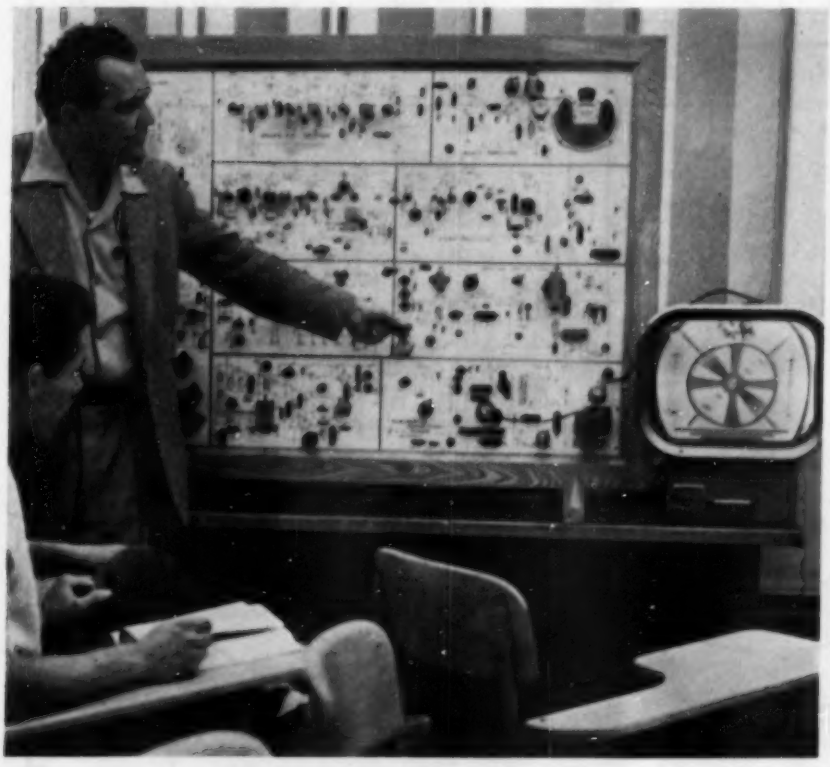
Mounting of resistors and capacitors was done by drilling small holes through the panel and using high-grade insulating tubing over the leads to prevent grounding. Such a method could not be tolerated in any equipment except something of this type, but has given no trouble whatsoever. Resistors or capacitors that need to be removed for class demonstrations are mounted on small 3-connector Amphenol plugs which can be easily removed or inserted in the circuit. Eighteen of these plugs are used in this unit, but more or less could be used at the discretion of the builder.

The abnormally long leads caused no great difficulty. As would be expected, however, the long leads in the video amplifier do not increase its high frequency response. One change in the I.F. transformer was required, due to lead length; a turn was removed from each transformer, a simple job but necessary.

After all wiring and alignment was completed an aluminum back cover was constructed and secured with wood screws to the wood framework.

Connections to the 17BP4A picture tube unit is made through plugs so that the two units can be moved separately.

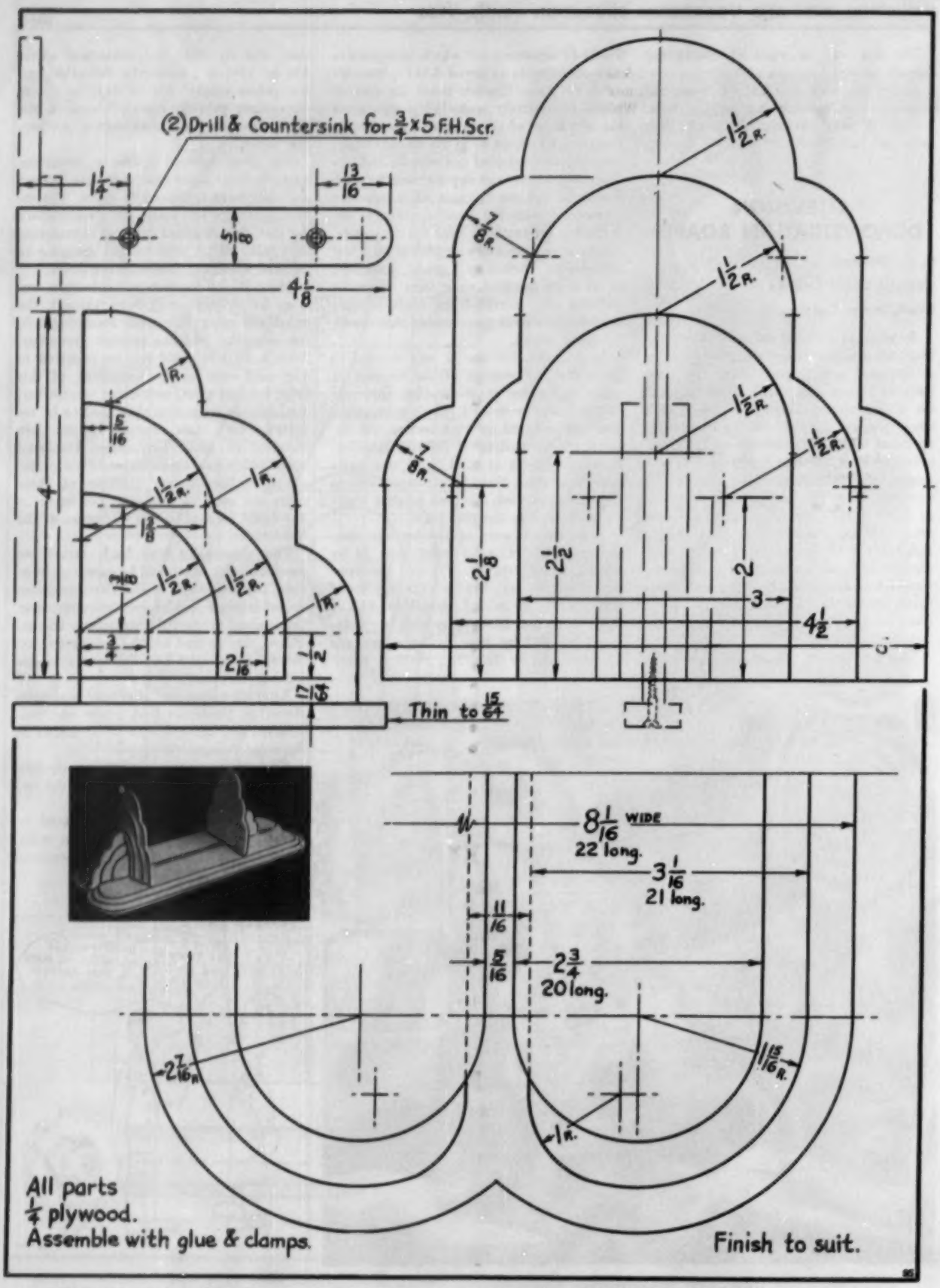
The use of this unit has facilitated instruction and is by now an almost indispensable tool in teaching vocational television.



Television demonstration board

LUNKHEAD LOUIE
NOW I WOULDN'T WANT YOU TO THINK I'M DUMPING, BUT HE ISN'T DOING WELL IN MATH, SO I'M GIVING HIM ANOTHER PERIOD OF METAL SHOP.
ENOS

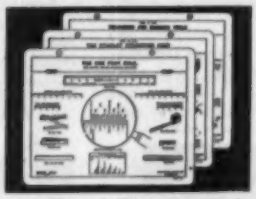
Submitted by Louis J. Enos, Lincoln Junior High School, Sacramento, Calif.



Binate broadening book braces. Details and halftone of the expandable bookrack by Stan Schirmacher, High School, Cottonwood, Ariz.

STANLEY SHOP TALK

INSTRUCTION CHARTS



Shop teachers find these STANLEY instruction charts real time-savers. They concentrate on show-how to build student know-how. Wordy description is cut to a minimum.

Each chart is printed on both sides of heavy, lacquered, extra large, 25″ x 19″ cardboard. There are 38 in the set, covering all the woodworking tools and seven of the more commonly used metal working tools. Complete set $6.00. Delivered anywhere in the U. S. A. Use coupon.

BIT BRACE & AUGER BIT

The Stanley "100 PLUS" No. 100—The Russell Jennings auger bit shown here is ideal for use with the 923 Brace. Individually tested, this double threaded screw point bit bores easily and cuts a smooth, accurate hole. Sizes 1/16″ to 25/64″.

The Stanley "100 PLUS" No. 923—This brace features the new, built-in Self-Centering Chuck that makes bit centering automatic and positive. It holds any size auger bit and straight shank drills from 1/8″ to 1/2″. 6, 8, 10, 12 and 14″ sweep.

WING DIVIDERS

The Stanley No. 58 designed for strength and durability. Non-removable clamping device holds either leg or pencil. Fine adjustment screw ensures accurate setting. All parts locked on except the leg . . . a really "Boy-Proof" tool.

The Stanley No. 57 has two solid steel legs. Otherwise like No. 58. Both styles have hardened and tempered steel legs. Available in 6″ and 8″ sizes.

"YANKEE®" SPIRAL RATCHET DRIVER

The "Yankee" No. 130A with quick-return spring in handle. Saves time and muscle. Supplied with three sizes of bits. "Yankee" Spirals available in three sizes, two styles. To convert this versatile tool for other jobs, buy accessories listed here.

BITS, DRILL POINTS, COUNTERSINK. Accessories available for "Yankee" No. 130A: Nos. 301, 302 and 303—Phillips bits in three sizes. No. 309—Adapter and 8 drill points. No. 3030—Countersink.

DOVETAIL FIXTURE

The STANLEY No. 61—Used with the versatile and popular STANLEY R8A Electric Router, this dovetail fixture adds cabinetmaker skill to school shop woodworking. Both front and side piece of the dovetail joint for drawer fronts are cut simultaneously in a few seconds with the R8A router and this attachment. Order the new router manual, *The Router—What It Is and Does*. 36 pages of information with more than 100 illustrations. Regularly 50¢, only 35¢ to schools.

Use this coupon for more detailed information and school shop help

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ASSOCIATION NEWS

(Continued from page 6A)

These student demonstrations in the use of many processes and materials were really outstanding.

W. C. Bohnsack was the chairman of the Friday afternoon program at which Harry Goldstein gave an excellent demonstration on how to make polaroid slides for visual aids.

At the same meeting, C. G. Schelly gave an address and explanation of the exhibit, titled "Civilization Through Tools."

The general meeting held at the Allen Bradley Company plant on Thursday evening was exceedingly fine entertainment. Both the company orchestra and the chorus were outstanding, as was also the fine dinner served to the visitors at the plant. The program planners deserve a real "thank you" for this fine meeting.

The annual banquet was held on Friday evening.

Burl N. Osburn was the general chairman and Kenneth F. Perry was toastmaster.

A special citation was given to Dr. DeWitt Hunt, thanking him for his fine work as editor of the *Industrial Arts Teacher*.

Dr. Harold S. Vincent, superintendent of schools of Milwaukee, gave the main address at the banquet. He gave high praise to industrial arts in general, and emphasized that far from being a frill, it is undeniably a part of general education.

As usual the *Ship's* program followed immediately at the end of the banquet program.

The officers for the coming year are: president, Roy A. Radtke; vice-president, Kenneth F. Perry; and the executive secretary and treasurer, Kenneth W. Brown.

The officers for the coming year of the American Council of Industrial Arts Teacher Education are: president, R. Lee Hornbake; vice-president, John A. Fuzak.

The next convention will be held in Kansas City, Mo.

COMING CONVENTIONS

June 11–15. Colorado Vocational Association, at Colorado A. & M. College, Fort Collins, Colo. Secretary, Wynona Swepston, Fountain High School, Fountain, Colo.

June 23. National Council of Technical Schools, at President Hotel, Kansas City, Mo. Secretary, H. E. McCallick, University of Houston, Houston, Tex.

AUDIO-VISUAL CONFERENCE

School administrators, supervising teachers, vocational instructors and classroom teachers from Minnesota and Wisconsin met on the campus of Stout State College all day Tuesday, April 10, for Stout's fourth annual audio-visual conference.

This year's meeting was based upon "Financing of Audio-Visual Programs." Stout sponsored the meeting in co-operation with the Wisconsin Department of Audio-Visual Instruction, an affiliate of the National Education Association, and also the Wisconsin State Department of Public Instruction.

With Dr. Herbert Anderson, head of the college woodworking department presiding at a general session, conference participants were welcomed by Dr. Verne C. Fryklund, president of Stout State College.

Keynote address of the opening session was given by Professor L. C. Larson, president of NEA's department of audio-visual instruction, and director of the audio-visual center at Indiana university.

Four sectional meetings were held. Beatrice Burgdorff, supervising teacher of the Waukesha county schools, led the discussion on "Financing the County Audio-Visual Program." Recorder was Dr. Robert Swanson, assistant professor of industrial education at Stout.

"Organizing and Financing the Co-operative Film Library" was the topic of a panel composed of the following persons: Robert Krueger, chairman, director of audio-visual education, River Falls State College; C. J. Krumm, Encyclopedia Britannica Films; and Earl Ellis, Coronet Films. Edsel A. Vergin, audio-visual co-ordinator of the Ellsworth public schools, served as recorder.

Following luncheon, a section was devoted to "Financing the Rural School Audio-Visual Program." Leading the discussion was Robert Fowler, superintendent of Winnebago county schools. Recorder for the sectional was Louis Slock, audio-visual director of Eau Claire State College.

With T. A. Johnson, supervisor of visual education in the St. Paul, Minn., public schools as leader, another group dealt with "Financing the Small City Audio-Visual Program." Mr. Johnson is also president of the Minnesota Department of Audio-Visual Instruction. William Terrill, principal of Menomonie high school, was recorder.

Dr. David P. Barnard, director of Stout's audio-visual center, presided at the closing general session. Following reports of the recorders, James Solberg, president of the Menomonie Board of Education and Chamber of Commerce, explained, "As I See It." Professor Larson concluded the session with a conference summary.

♦ The Iota Alpha Industrial Arts Fraternity at the Moorhead State Teachers College, Moorhead, Minn., sponsored a Fiberglas demonstration on February 15, 1956.

Lee Gresser, industrial-arts instructor at

(Continued on page 12A)

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OR MAN...

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You know what it means to a boy when he feels he is doing *real* work with *real* tools. He has an added incentive to *work* and to *think*. He's off to a good start . . . enthusiastic . . . eager to learn. It's a pleasure to have him in your class.

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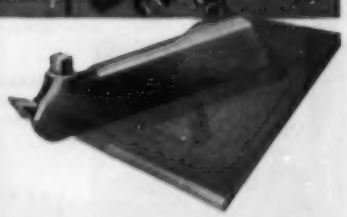

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ASSOCIATION NEWS

(Continued from page 10A)

Osseo, Minn., gave demonstrations for making a Fiberglas chair and bowl.

Charles Shubat of the Minnesota State Department of Trade and Industrial Education gave a demonstration for making a fishing tackle box.

At the conclusion of the demonstration the men were given the opportunity to make a Fiberglas bowl. These materials were donated by the Industrial Arts Supply Company of Minneapolis.

The Industrial Arts Fraternity served lunch to 96 guests from schools in Minnesota and North Dakota. Door prizes were furnished by the industrial-arts staff of the college.

♦ The Arizona Industrial Arts Association elected the following officers at their recent annual meeting at the Phoenix Union High School, Phoenix, Ariz.: president, William Anderson of Camelback High School, Phoenix.; vice-president, Leo Houghton of Safford Junior High School, Tucson; secretary-treasurer, Harry A. Goldstein, Tucson High School, Tucson, Ariz. — *Harry A. Goldstein, A.P.S.A.*

♦ At a recent meeting of the Indiana Industrial Education Association, the following officers were elected: president, Floyd Dickey, John Adams School, South Bend, Ind.; vice-president, Wm. James, Senior High School, Anderson, Ind.; secretary-treasurer, H. G. McComb, 215 State House, Indianapolis, Ind.

The next meeting place for the convention will be at Purdue University, West Lafayette, Ind., on April 11, 12, and 13, 1957. — *H. G. McComb.*

♦ The Idaho Industrial Arts Association held its first annual meeting at Pocatello, Idaho, on Friday, April 13, 1956.

The meeting was conducted by the president, Paul O. Blair.

Karl E. Hart of Ricks College, Rexburg, Idaho, was the principal speaker, and discussed "Baking an Industrial Arts Cake."

A constitution and bylaws were adopted, and a report was given by the treasurer.

The officers elected for the coming year are: president, Asael E. Bell, Preston High School, Preston; vice-president, Thomas Matthews, St. Anthony High School, St. Anthony; secretary-treasurer, John Finley, Paris High School, Paris, Idaho. — *Paul O. Blair*

♦ The fifth annual North Carolina Industrial Arts Association State Fair was held on May 11 and 12, 1956, at Proximity Junior High School, Greensboro, N. C. This is the first two-day fair to be attempted in North Carolina. The registration of projects took place on Friday up to 3:30 p.m., and in the evening the judging was scheduled to begin at 9:00 p.m. Twelve judges from Kentucky, South Carolina, Virginia, Tennessee, and North Carolina were on hand to serve as judges of the projects.

The guest speaker at the dinner meeting on Friday night was R. Lee Hornbake, University of Maryland, College Park, Md.

The speaker for the luncheon meeting on Saturday was Dr. Dewey Barich, educational affairs, Ford Motor Company, Detroit, Mich.

The Executive Board set the meeting place for the fall meeting at Rocky Mount, N. C. — *K. C. Sinclair, public relations chairman.*

♦ The annual state convention of the Washington Industrial Arts Association was held in Spokane, Wash., March 30 and 31, 1956. Headquarters for the meeting was the John Rogers High School.

The annual banquet was held at the Spokane Hotel with David E. Watson, president of the Thomas Consolidated Mines, Inc., as guest speaker.

Dr. D. Grant Morrison, Office of the State Department of Public Instruction, was the guest speaker at the annual breakfast at the Desert Hotel.

Other high lights of the convention included the industrial exhibits; demonstrations by students under the direction of Robert E. Kuhl, W.S.C., and Orland B. Killin, E.W.C.E.; and the election of officers for 1956–57.

The new president is Charles B. Thuot, Kennewick Senior High School, Kennewick; vice-president is Melvin Kirkland, Pacific Prevocation School, Seattle; and secretary-treasurer is Wallace Bennett, Kennewick Junior High School, Kennewick, Wash.

Next year's convention site will be Kennewick, Wash. — *Wallace Bennett.*

♦ The Massachusetts Industrial Education Society held its tenth annual Project Fair at the Stoughton High School on Saturday, May 12, 1956. The best projects made by industrial-arts students throughout the state were on display.

Last year the projects were exhibited at Natick High School. The Society's policy is to have the fair in a different community each year.

The fair is also the occasion for the spring convention of the society. Between 200 and 300 industrial-arts teachers usually attend the fair.

This local fair is preliminary to the national fair held annually in Detroit, Mich. The Ford Motor Company, sponsor of the nationwide fair, awards bronze pins at the state fair, to students whose projects are outstanding, and certificates to all students whose projects are deserving of commendation.

Many of the outstanding projects will be entered by the local schools in the national fair.

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Personal News

FRASER TO TEACH SUMMER SCHOOL IN NOVA SCOTIA

Roland R. Fraser, principal of the Washington Trade School, Detroit, and a member of the co-operating faculty of Wayne University will be the guest instructor this summer for the Industrial Education teachers of the Province of Nova Scotia, Canada.

At Wayne University Mr. Fraser teaches courses in *Teaching Aids and Devices, Techniques of General Metalwork, Advanced Techniques of General Metalwork,* and *Shop Organization and Management.* This summer at Halifax, Nova Scotia, he is scheduled to teach *Occupational Analysis and Course Construction* which is offered in connection with the summer session program at Dalhousie University.

Roland R. Fraser

Mr. Fraser holds a B.S. degree from Stout State College and a master's degree from Wayne University. In addition he has taken considerable credit on the postmaster's level.

Mr. Fraser has been employed by the Detroit board of education for the past 25 years. In his many years with the Detroit schools he has served as a teacher, department head, supervisor, assistant principal, and principal. During World War II he started as supervisor and then became the director of the Vocational Training Program for War Production Workers conducted by the Detroit schools.

He is coauthor of "General Metal Principles, Practices and Projects," published by Prentice Hall Publishing Company. This is a textbook covering the basic occupational areas in metalworking.

HERBERT WARFEL RETIRES

Herbert Warfel, teacher of printing at Joliet Township High School, Joliet, Ill., since 1923, is retiring this year.

His printing experience started rather early in life. He fed his first job standing on a type box in front of a Peerless press when he was eight years old. He continued working at the trade until he entered college.

His first job teaching printing was at the Garfield Junior High School, Richmond, Ind., in 1918. After two years he went to the senior high school at Logansport, Ind. After three years at this school, he took charge of the printing department at the Joliet Township High School under the superintendency of the late Dr. L. W. Smith and the directorship of Dr. Lynn A. Emerson.

Mr. Warfel attended the University of Chicago and DePaul University, at the latter of which he obtained his bachelor's degree. He is a charter member of the International Graphic Arts Education Association, and has served as regional vice-president as long as that office has existed. He has belonged to the International Typographical Union for 38 years.

Herbert Warfel

DOUGLAS R. SHERMAN

Douglas R. Sherman of the University of Alabama has completed all requirements for the doctor of education degree at Wayne University, and the degree will be conferred in June.

Sherman's dissertation, "The Emerging Role of Vocational-Terminal Education in the Public Community Colleges of Michigan," reflects his long time interest in the community college program as well as the fact that he was active in the community college

(Continued on next page)

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PERSONAL NEWS

(Continued from previous page)

Douglas R. Sherman

movement before becoming engaged in teacher education. The dissertation itself was carried on in co-operation with the Michigan Committee for Vocational Teacher Education and the Michigan Community Colleges, and portions of it have already been applied by various educational groups. Dr. G. Harold Silvius has indicated that Wayne University will publish a booklet based on this research, and that it will be distributed to the Michigan Community Colleges, vocational educators, and other interested persons.

An instructor in the Department of Industrial Education at Wayne University, Sherman resigned from that position last June to accept an assistant professorship at the University of Alabama. During the summer of 1955 he traveled throughout Southeast Asia as one member of a four-man technical education survey team studying various institutions and educational organizations in Thailand and Indonesia. The team was under the sponsorship of the International Co-operation Administration, but had been invited by the respective governments.

HOMER J. SMITH'S WIFE DIES

Esther Crombie Smith, born in Chicago, August 15, 1885, died in Minneapolis, Minn., March 13, 1956.

They were married in 1914, and since then have lived in Milwaukee and Minneapolis.

All of his many friends join in expressing their deepest sympathy.

♦ Dr. Verne C. Fryklund, president, Stout State College, Menomonie, Wis., was named as a consultant to participate in the Tuskegee Institute self-study. This project of the famous Negro college is an important factor in the Institute's Diamond Jubilee.

Dr. Fryklund was on the Tuskegee campus for almost a week at the end of March to observe and evaluate the School of Mechanical Industries there. He was also present for Tuskegee's Ninth Annual Trade and Engineering conference.

The goal of the self-study in which Dr. Fryklund assisted is "to aid Tuskegee in clarifying its objectives, strengthening its program content, and improving its operation."

♦ Russell G. Louis, associate professor of industrial education, Virginia Polytechnic Institute, Blacksburg, Va., has taken a leave of absence to accept a two-year assignment with the International Co-operation Administration in Haiti.

As an Industrial Arts Technician in Haiti, he will lend technical advice and assistance to the government of Haiti in such fields as carpentry, furniture and cabinetmaking, weav-

(Continued on page 16A)

NEW! craftool DUSTMAN

Takes the sawdust and dirt out of shop work AT THE SOURCE!

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See what a difference Dustman will make in the school shop — no more messy, littered floors, no more wasting of valuable teaching time on hours of cleanup. Just connect Dustman to any machine — and it gathers up all sawdust, wood chips and metal shavings the instant they're formed at the source. Then it discharges them into a waste can — and your shop is clean, the air healthfully pure and dust-free.

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- PLUGS INTO ANY AC OUTLET!
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PERSONAL NEWS

(Continued from page 14A)

ing, ceramics, masonry, and metalworking, and will collaborate with the pre-service and in-service teacher education program to train Haitian teachers in industrial-arts activities.

Mr. Louis received the B.S. degree from Oswego State Teachers College, and the M.S. degree from Cornell University.

♦ Dr. DeWitt Hunt, federal specialist for industrial arts, is leaving his post on June 1, 1956. The U. S. Office of Education is now searching for a person to fill the $9,000 post.

♦ Dr. Robert L. Thompson of the Department of Vocational Education, at New York University School of Education, New York City, spoke at the annual New Jersey Vocational and Arts Association Convention in Asbury Park, N. Y., on March 17, 1956.

The subject of his talk was "A Program of Industrial Arts Education for the Next Several Decades (1956–1976)."

Professor George Ditlow of Newark State Teachers College, and John Smith, state supervisor of industrial arts, assisted Dr. Thompson in presenting research and state data.

♦ Dr. Carlton E. Bauer, assistant professor of education, Department of Vocational Education, New York University School of Education, New York City, spoke on "Blackboard Techniques" at the Allentown, Pa., Mid-Term Workshop on February 22, 1956.

Dr. Bauer will teach a course in drawing and design for industrial arts at Bennett College, Bradley University, from June 18 to June 30, 1956.

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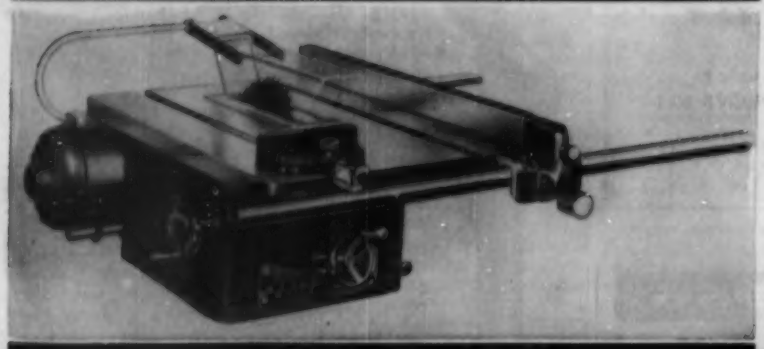

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STREET.....

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♦ Professor Roland H. Spaulding, director of vocational rehabilitation curriculums, New York University School of Education, New York City, was the banquet speaker at the State Convention of the Michigan Federated Chapters of the International Council for Exceptional Children on March 9, 1956. His topic was "Special Education for What?"

This convention was held on March 9 and 10 at the Hart Hotel, Battle Creek, Mich.

♦ The following teachers were added to the industrial arts and vocational education department of the Tulsa, Okla., public school system, during the past year: Joe Cuffel, woodwork at Will Rogers High School. John Vaughn, handicrafts and printing at Carver Junior High School. Clyde Clover, drawing and woodwork at Roosevelt Junior High School. James Lyons, general metals at Wilson Junior High School. Vernon Kolb, handicrafts at Alexander G. Bell Junior High School. Jim Utley, wood, drawing, and electricity, at Horace Mann Junior High School. H. A. Allender, drafting, Edison High School. Joe Lemley, drafting, Central High School. Rex Buchanan, drafting, at Webster High School. E. M. Hale, formerly of Horace Mann Junior High School; and Harry McGinnis, of Roosevelt Junior High School, have retired.

♦ Robert P. Glassett has been appointed itinerant teacher with the Middlesex County Vocational and Technical High Schools, New Brunswick, N. J. He joined the system this past fall to handle special classes in the many surrounding industrial plants.

♦ Vera E. Cleaves and Edgar J. Tulloch have been added to the industrial-arts department staff at State University of New York, College for Teachers, Buffalo, N. Y.

STUDENT WINS NATIONAL A.A.U. GYMNASTIC CHAMPIONSHIP

James B. Bown, an industrial-arts major at the Los Angeles State College, won the Sidehorse Championship at the National A.A.U. gymnastic meet held in Rochester, N. Y., April 29–30, 1955. James is in the junior class at the college and has an excellent scholarship record. His favorite industrial-arts areas are general metal and woodwork. He is 24 years old, weighs 140 pounds and is 5 ft. 11 in. tall.

James B. Bown, winner of the Sidehorse Championship at the National A.A.U. gymnastic meet.

He began competition while in high school. He won the Southern Pacific Association Junior A.A.U. Sidehorse Championship in 1950. Following this he placed in Southern Pacific and National Senior A.A.U. Championships. After serving two years in the U. S. Marine Corps he re-entered competition and on March 25–26, 1955, placed second behind Carl Rintz of Michigan State in the National Collegiate Gymnastic Championships held at U.C.L.A. Rintz was among those Bown outscored in Rochester last April at the National A.A.U. Championships.

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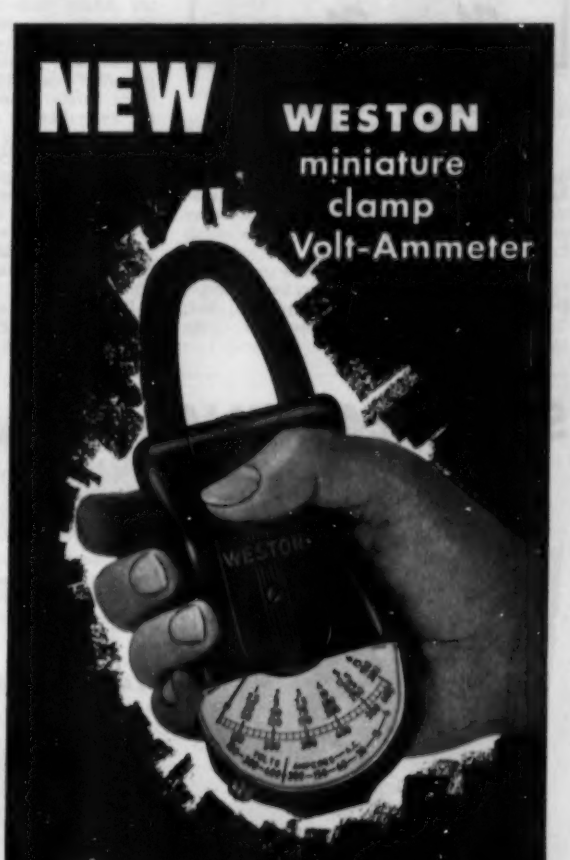
NEW WESTON miniature clamp Volt-Ammeter



with shock-mounted core magnet mechanism!

Lightweight and really pocket size... yet this instrument packs new ruggedness and dependable accuracy. Employs CORMAG® self-shielded mechanism with spring-backed jewels, which is shock-mounted in the sturdy Bakelite case. Window, too, is of shatterproof Plexiglas, wrap-around design. Only one easily read scale for all ranges and functions. Jaws take up to 1" round, or 1¾" rectangular conductors. Ranges—Current: 300/150/60/30/15/6 amperes a-c—Voltage: 600/300/150 volts a-c. At local distributors or write — WESTON Electrical Instrument Corporation, 614 Frelinghuysen Avenue, Newark 5, New Jersey.

Supplied in this sturdy, scuff-proof case with compartment for voltage test leads.

WESTON *Instruments*

News Notes

COURSE IN AUTOMOTIVE ELECTRICITY

If you're a vocational instructor in automotive electricity, apply to be admitted to Delco-Remy Division of General Motors *free* summer courses in automotive electricity. Many colleges and universities will now give credit for attendance at these schools.

For further information write to F. P. Plovick, manager of field service, Delco-Remy, Division of General Motors, Anderson, Ind. These courses are given June 18–29; July 16–27; and August 13–24.

♦ A safe environment is an essential part of the school shop safety education program. The safe environment will exist only if hazards are discovered and corrected through *regular* and *frequent* inspections by school personnel — administrators, teachers, and students. Safety inspections determine whether or not everything is satisfactory.

Inspections may be made at the request of the board of education, the school administration, or upon the initiative of the teacher. Some communities have drawn upon the cooperative service of professional safety engineers, inspectors of state labor departments, insurance companies, and local safety councils, to supplement and confirm inspections by school personnel.

In response to a major recommendation of the first President's Conference on Industrial Safety, the Joint Safety Committee of the National Safety Council and the American Vocational Association developed a National Standard School Shop Safety Inspection Check List to facilitate these inspections and pinpoint factors that need checking.

The check list is now available from the National Safety Council, 425 No. Michigan Ave., Chicago 11, Ill., in packets of fifty for $1.

♦ Two departments of the Rochester Institute of Technology, 65 Plymouth Ave., South Rochester 8, N. Y., will offer special printing courses during the coming summer.

Byron G. Culver, head of RIT's Department of Printing, recently announced that three six-week courses especially adapted to meet the needs of junior and senior high school industrial arts and vocational instructors will be available beginning July 2 and ending August 10.

♦ An award — probably the first of its kind — to encourage engineering students to broaden their interests beyond the limits of professional competence is being established at the University of Illinois, Urbana-Champaign, Ill., as a memorial to Lisle A. Rose, professor and editor, who died suddenly last year. The winner will get a certificate and cash award.

Funds are being solicited by his colleagues and friends here and at Michigan Tech where he taught before 1947. They explain the purpose of the award as "to encourage engineering students to liberalize their views through the selection of nonprofessional courses and participation in cultural activities."

♦ Now on the campus of Stout State College here are 20 trade school teachers and supervisors from the Phillipines who will take a six-week "Seminar on Teacher Training" under the auspices of the college. An additional participant is from India.

During their stay until May 18 the visiting educators will have a chance to observe an American college in action and see how industrial education at the college level is taught in the United States.

Each visitor will take six special courses during his stay. These include Philosophy of Vocational Education, taught by Dr. Verne C. Fryklund, president of Stout; Trade Analysis, by Dean John A. Jarvis; Techniques of Group Leadership, by Norman Ziemann; Curriculum Procedures, by Dr. Robert Rudiger; Audio-Visual Education, by Dr. David Barnard; and Methods of Teaching Industrial Arts, by Dwight D. Chinnock.

♦ The Industrial Arts Division, Wisconsin State College, Platteville, Wis., will hold an Industrial Arts Clinic, June 18 to 22 inclusive.

Work will be offered in graphic arts, art metal, plastics, and leatherworking. Techniques in other areas will be given according to student need.

For information on credit and details write to Director, Industrial Arts Division, Wisconsin State College, Platteville, Wis.

♦ In Tulsa, Okla., three new junior high schools are being planned. All of these new junior high schools will contain three industrial-arts shops, drawing and woodwork, general metals and electricity, and handicrafts and printing.

The new Thomas A. Edison Senior High School is under construction and will be ready by next fall. This school contains facilities for woodwork, auto mechanics, drafting, radio and electricity, distributive education and diversified occupations.

♦ Sixty Industrial Arts Teachers from Northwest Iowa and Southeast South Dakota attended the Seventh Annual Conference at Westmar College, Le Mars, Iowa, on Saturday, April 7.

High points on the program included a very interesting talk by T. A. Hippaka, professor of Industrial Education at Iowa State College, on "Modern Trends of Industrial Education." Leo Ketch, a representative of the Porter

Shop TEACHING AIDS...
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"MICROMETER READING MADE EASY"
Interesting 12-page booklet is cleverly illustrated in cartoon style. Tells how to read to both thousandths and ten-thousandths of an inch. How to care for and adjust a micrometer.

"TIME SAVERS"
Circular slide rule type. Gives size of tap, threads per inch, size of tap drill, and decimal equivalents.

"DRILL CARDS"
Gives decimal equivalents of parts of an inch on one side, and decimal equivalents of number size drills on the other side.

"THE AMAZING STORY OF MEASUREMENT"
20-page four-color booklet traces the history of measurement from prehistoric times to the present. Interesting cartoon style.

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Please send me, without charge, shop teaching aids in the quantities indicated.
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299

Cable Tool Co., gave a very fine demonstration of Portable Machines.

This conference was under the direction of Eldon Danne at Westmar, who has headed this department for the past 14 years. Of the 60 attending, 24 are Westmar graduates who are now teaching industrial arts and coaching in Northwest Iowa.

New Publications

How and Where to Get a Summer Job

By Tom Riley and Ione R. Henrikson. Paper, 128 pp., 6¼ by 9¼ in., illus., 75 cents. Popular Mechanics Press, Chicago, Ill.

A valuable book for boy and girl students between the ages of 14 and 22. The book enumerates a thousand possibilities for summer employment. It also gives a summary of child labor laws in the various states of our country.

Crafts for School and Home

By Gretchen Grimm and Catherine Skeels. Cloth, 128 pp., 6⅛ by 9¼ in., illus., $2.95. The Bruce Publishing Co., 400 N. Broadway, Milwaukee 1, Wis.

An interestingly written and illustrated book that aims to help teachers, parents, and others to guide children by showing them how to make and do things to shorten leisure time which otherwise would hang heavy on the children's hands.

It will be found helpful to camp workers, and handicraft teachers, and leaders. It describes how to make articles of paper and cardboard, wood, metals, cloth, and odds and ends, and also how to prepare foods.

It is an excellent medium for getting youngsters acquainted with the value of a hobby.

Making Things of Wood

By Lyle P. Soeteber and Paul R. Moore. Paper cover, 150 pp., 6⅛ by 9¼ in., illus., $3. Chas. A. Bennett Co., Inc., Peoria, Ill.

This book presents 37 projects which will interest almost any boy, whether he be of junior or senior high school age.

There are simple projects for the beginner, and there are some that will challenge the more advanced students.

The book also explains how to select and finish projects, and what teaching aids, magazines, and other means may be used to make the work interesting and appealing to the shop student.

Technical Drafting Essentials

By Warren J. Luzadder. Architectural Drafting Section by William J. Hornung. Cloth, 343 pp., 6⅛ by 9¼ in., illus., $3.75. Prentice-Hall, Inc., New York, N. Y.

This is the second edition of this text. It has been revised in order to make some of the material more complete. Thus, the dimensioning chapter has been expanded, and some of the tables have been revised to conform to drafting standards of the ASA and SAE.

A number of the pictorial presentations have been shaded so that they can be more easily visualized.

Two new sets of problems, prepared by Roy Bolles and Warren J. Luzadder are now available for use with this text.

Closed-Circuit and Industrial Television

By Edward M. Noll. Paper, 230 pp., 6 by 9 in., illus., $4.95. The Macmillan Co., New York, N. Y.

This book shows how television can be applied in industrial plants, business houses, stores, shops, schools, and in the home.

It explains what a closed-circuit television system is, how a picture is transmitted, explains the scanning process and the formation of a composite signal, camera tubes and circuits, video amplifier systems, sync and deflection generators, commercial cameras, and explains the construction of a closed circuit camera.

Television, How It Works

By J. Richard Johnson. Marco cover leather finish, 352 pp., 5½ by 8½ in., illus., $4.60. John F. Rider Publisher, Inc., New York, N. Y.

This is the second edition of this text, which explains the how and why of television receivers in simple and direct terms. It may be used in teaching the subject in the school, or by the interested student in his home.

The book presents the general aspects of television systems; TV propagation, antennas, and transmission lines; TV front ends; Video I-F, detector, and AGC sections; Video amplifiers and D-C restorers; F-M sound channels; synchronizing sections; sweep circuits; picture tubes; power supplies; and color television.

Family Focus in Home Economics Teaching

Prepared by the Home Economics Committee on Research, American Vocational Association, Inc., 1010 Vermont Ave. N.W., Washington 5, D. C. Paper, 36 pp., 6 by 9 in., illus., 15 cents, with a discount of 10 per cent for orders of ten or more.

An interesting little booklet which will introduce girls and boys to the family problems which will confront them in the not-too-distant future.

The Crow Electri-Kit for Beginners and the Crow Basic Electronics Kit have brought electricity and electronics into thousands of schools . . . schools where these subjects were long considered too difficult or too expensive to teach.

Now Crow brings you Model 53—a unique *Advanced Electronics* kit. This "learn-by-doing" kit gives your students penetrating insight into the fascinating world of Radio Transmitting and Receiving, Industrial Electronic Controls, Electron Tube Theory, and Basic Radar and TV.

With the kit's 108 components, students *build their own operating assemblies.* A correlated, 600-page work manual gives complete directions for assembly plus historical background and practical applications of each experiment. Written in simple language using only elementary mathematics, the manual permits teachers with limited technical training to teach the course easily.

Model 53 is the comprehensive, common-sense way to practical electronic knowledge, yet its cost is remarkably low. The complete kit as shown above—*nothing else to buy*—costs only $193.75. *Write for illustrated folder.*

CROW ELECTRI-CRAFT CORPORATION

Division of Universal Scientific Co., Inc. • Box 3366 • Vincennes, Indiana

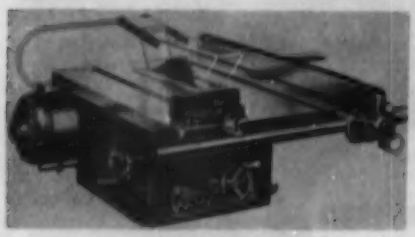
Shop Equipment News

NEW 10-IN. BOICE-CRANE TABLE SAW

A new 10-in. Table Saw with improved floating-pulley drive has just been announced by the Boice-Crane Company.

The new power drive makes the motor an integral part of the unit, but the unique rolling-type of floating pulley makes tilting the motor unnecessary. Belt tensioning is automatic.

Another feature of the new drive permits powering for heavy work by motors up to 1½ h.p.



New 10-inch Table Saw with Floating Pulley Drive

The saw has a 20 by 27-in. ground worktable, which with extensions increases to 36 in. wide. It is available with a full cabinet base floor model or as a bench model. It also has a miter-cutoff guide with adjustable autostops, a cast ripping gauge with both sides precision ground operated by triple-action controller.

Ball bearings and ground blade arbor are larger than usually found in 10-in. table saws. Arbor handles dado cutters for grooving as wide as 1 13/16 in.

The new saw rips to the center of a 74-in. wide plywood panel; cuts off 14 in. wide on 1-in. thick stock, or 13 in. wide on 3-in. thick stock.

A brochure may be obtained by writing for it.

(For Convenience Circle Index Code 0601)

DoALL TABLE EXTENSIONS FOR SAWING METAL PLATE

Setups for straight or angle cuts in metal plate or flat stock are made in a few minutes with a new table accessory for DoALL Contour-matic Sawing Machines.

This accessory consists of T-shaped bars designed to fit the T slots in the hydraulically actuated tables characteristic of these machines.

The bars an be slid in or out of the table slots independently, and quickly locked in any position with an Allen wrench. In this manner the bars can be adjusted to provide outboard support for stock longer than the capacity of the table.

DoAll Table Extensions

Studs on the ends of the bars serve as stops. The bars can be adjusted so that the studs bear against the edges of rectangular or irregularly shaped pieces which have been placed on the band machine table in the desired position for cutting. A twist of the table feed control and the stock is carried into the saw band for cutting at the desired angle.

Once the bars are set, any number of similar pieces can be cut rapidly.

For additional information on this new band saw accessory and DoALL semiautomatic band sawing machines for metal, write The DoALL Company.

(For Convenience Circle Index Code 0602)

"EASY-STAGES" BUYING OFFERED

In merchandising the new Combination Saw-Jointer-Sander, introduced last fall by Yates-American Machine Company, a new purchase

ALL NEW, COMPLETE CATALOG OF

WOOD & WOODWORKING EQUIPMENT

FREE TO INSTRUCTORS

Finest Domestic and Rare Woods . . . Molding . . . Tools ALL AT LOWEST PRICES

INSTRUCTORS! Just mail coupon for your FREE COPY (25c to students) of our giant new woodworking catalog. We are America's largest source of fine domestic and rare imported woods for projects. Also bandings, veneers, inlays . . . all shown in full color. Includes over 250 scroll patterns. Hot newest tools, equipment and hard-to-find cabinet hardware. Rush your request today!

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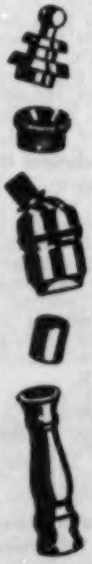


THE GEARON COMPANY

Dept. 100-K6 • 27 S. Desplaines St. • Chicago 6, Ill.

plan has been devised for this handy workshop tool.

The Combination Unit can also be obtained

Combination Saw-Jointer-Sander Unit

in individual units, starting with the basic 8-in. saw, the 4-in. jointer, and the 10-in. sander. Thus, the new Yates-American 8-in. saw can be converted to a complete Combination Unit as the User's budget allows.

Further information is available upon request.

(For Convenience Circle Index Code 0603)

NEW KNIGHT KIT "SPACE SPANNER"

Allied Radio Corporation announces the release of their new Knight-Kit "Space Spanner," short wave and broadcast receiver kit. Easy to build and surprisingly low in cost, the "Space Spanner" is a rewarding project for young and old alike. Highly efficient and com-

New Knight Kit Space Spanner

plete with built-in loudspeaker, it provides short wave coverage from 6 to 18 megacycles, and by simply flipping a switch, it also tunes in standard broadcasts. A.c. operated, the "Space Spanner" requires no batteries. Easy-to-follow instructions with pictorial and schematic diagrams make assembly a snap — even for those with no previous wiring experience.

The space spanner pulls in foreign broadcasts from many parts of the world, plus amateur, aircraft, police, and marine radio.

(For Convenience Circle Index Code 0604)

"DOIT" YOURSELF PRECISION TOOLS

With the announcement of "Doit" Yourself Precision Tool Kits a radically new idea was introduced. These tools, made by S. J. Williams Company, are ideal for school projects. They offer the student the opportunity of learning how to make a precision tool.

Each "Doit" Yourself kit includes complete drawings and all materials for finishing the tool.

There are 14 "Doit" Yourself Precision Tools immediately available. These include the

(Continued on next page)

New Versatility

for Dial Indicator Work!

Precision checks with dial indicators are easier to get across to students with the aid of these two modern Brown & Sharpe Tools. Their versatility makes difficult tests quick and easy . . . gives *you* new latitude in demonstrating proper checking methods. Invaluable instruction aids on the machine or at the bench, their high quality assures you lasting on-the-job accuracy. Write for full details on these and other Brown & Sharpe Dial Indicators and related tools. Brown & Sharpe Mfg. Co., Prov. 1, R. I.

New MAGNICATOR® for Dial Indicators
Use this tool in *any* position on steel or iron surfaces! Fully-releasing, permanent magnet base holds from two sides and bottom — V section holds to round surfaces. Simple push-button controls holding power . . . press from back for "ON" . . . press from front for "OFF". For use with indicators having either cylindrical or ball-socket type swivels. A small, lightweight tool you can easily handle with one hand.

New BesTesT Dial Indicator
Perfect complement to the Magnicator! Also for use on height gages, surface gages, and similar holding tools. Dial reading balanced 0 to 15 to 0 in clear, black figures and graduations. Smooth, low-friction movement. Snap-lever provides quick reverse of contact point direction. High-utility swivel permits "up close" or extended use. A truly compact, high precision indicator that makes "tight" spots easily accessible.

BUY THROUGH YOUR LOCAL DISTRIBUTOR

Brown & Sharpe B&S

SHOP EQUIPMENT NEWS

(Continued from previous page)

following kits: toolmaker's vise, magnetic parallels (in a variety of lengths and laminations), magnetic V blocks (also in a variety of lengths and laminations), 5-in. sine block and V blocks and clamps. Eventually there will be over 20 tools in the "Doit" Yourself line.

In completing the tools, students follow simple drawings. They learn by doing. Some machining is required. Each kit when finished provides the student with a fine quality precision tool.

(For Convenience Circle Index Code 0605)

MAGNETIC BASE INDICATOR HOLDER

This new No. 657 Starrett Magnetic Base Indicator Holder developed by The L. S. Starrett Company, is designed to simplify and speed up setup, checking and inspection jobs requiring the use of dial indicators.

New Starrett No. 657 Magnetic Base Indicator Holder

A powerful permanent magnet type base holds firmly to any iron or steel surface in any position, horizontally, vertically, or upside down. A large-diameter push button turns the magnetic force on or off; makes it possible to position and secure the base with one hand.

The base measures $1\frac{15}{16}$ in. high by $1\frac{5}{8}$ in., by $1\frac{7}{8}$ in. The swivel post assembly is $6\frac{1}{8}$ in. high.

Additional information is obtainable by writing for it.

(For Convenience Circle Index Code 0606)

NEW ELEVATOR-TYPE ELECTRIC FURNACE

A new high temperature inverted pit-type furnace, known as Model IP-6700, has just been announced by the Pereny Equipment Company. It is provided with a vertical elevator type closing arrangement, which permits the door, when lowered, to serve as a hearth that may be rolled to the front of the unit, to convenient location. This makes the unit adaptable to a wide variety of usage, especially where work to be handled involves heavy parts (up to 150 lb.) such as steel dies; or crucibles containing molten glass or metals. The parts are easily loaded onto the hearth or door which is then rolled on tracks back to position and raised to the pit-type work chamber.

New Elevator-Type Electric Furnaces

The chamber size of this Pereco Electric Furnace is 18 in. wide by 18 in. deep by 21 in. high. The unit's over-all size is 39 in. wide by 48 in. deep by 90 in. high. Raising of the hearth, which will take a work load of approximately 150 lb., is by a safety hand ratchet (power lift equipment optional).

This new unit, incorporating silicon carbide heating elements, has an operating temperature up to 2750° F., with a heat-up period (to maximum) of three to four hours.

Power rating is 35 KW, 220/60/3-phase (440/3 also available). All controls are mounted in a heavy steel panel, fully wired internally. Temperature controls are of all standard makes and with optionals as desired.

Further information is available upon request.

(For Convenience Circle Index Code 0607)

NEW FLUORESCENT LAMP

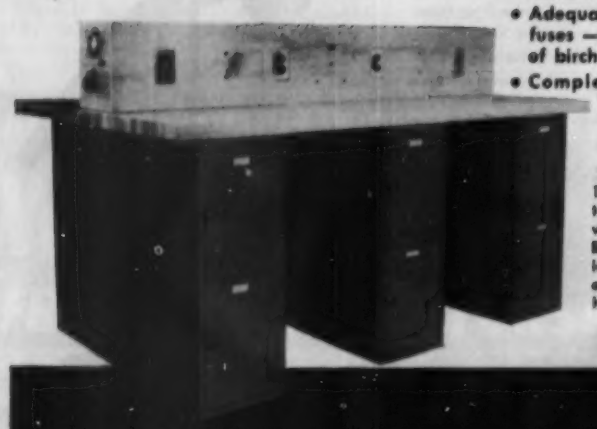
A new fluorescent lamp with double the light output of present tubes of equal length has been developed by the General Electric Company.

The increased light is made possible by a revolutionary change in tube design. It features a series of lengthwise dents or grooves along one side of the eight-foot-long flourescent tube. Because of its high light output and unique appearance, the new lamp has been named "Power-Groove."

At the grooves, the new tube is nearly U

B-G's NEW AC-DC POWER SUPPLY UNIT BENCH for all school electrical shop applications

- A complete packaged unit — wired and ready for use — just connect to 110 v. power.
- Accommodates 4 to 6 students at one time.
- Adequately protected by fuses — solidly constructed of birch plywood.
- Complete with operating instructions.



MODEL ET 10

1¾" laminated maple top (72" x 48"), fitted with ET 6 power unit. Base contains 12 steel locker openings, 6 on each side. Overall height 31¾".

Price $325.

The Power Supply Bench provides a complete packaged unit source of AC-DC power for the school electrical shop. It is wired and ready for use by simply connecting it to a 110 volt power source in the shop. The entire unit is fused for safety purposes.

ET 10 has the following power outlets: Eight 110 volt AC receptacles, two combination 6-12-18-24 volt AC tap stations, and four DC stations which provide DC power in a continuously variable voltage range from 0 to 30 volts. These four DC stations are controlled from a central position on one end of the unit. Thus the instructor can set-up an experiment for all students and be assured of the same voltage throughout. The DC circuit is of sufficient capacity to handle all current loads up to 10 amps.

New 1956 B-G Catalog now ready. Write for your copy.

BRODHEAD GARRETT CO.

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Individually Power-Tested for Better Performance

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SPRING CLAMPS

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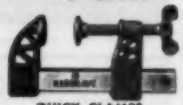
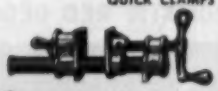

QUICK CLAMPS

CLAMP FIXTURES



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Shows a complete line of Clamps for all purposes, openings from ¾" to 12' and depths from 1/2" to 16". Chisels, Punches, Masonry Drills for hand and power hammers, Carbide Rotary Drills, Gasket Cutters, File Cleaners, etc.

THE CINCINNATI TOOL CO.
Waverly & Main Cincinnati 12, Ohio

A. T. S. Research Awards

To stimulate additional research in the field of vocational and industrial arts education, the American Technical Society will present awards totaling $2,000 in 1957 for research in this field. This new competition has been enthusiastically received by the leadership in the fields in which the research is to be conducted.

Entries and Criteria

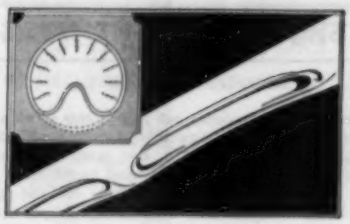
Any research study or record of a demonstration research project which develops new knowledge or principles upon which better practices can be developed, may be entered in the awards program. All entries submitted before July 1, 1957, will be judged by the Editorial Advisory Board of American Technical Society.

Awards Information

A First Award of $1,000 and up to five Awards of Merit carrying $200 each will be made if sufficient meritorious entries are received. Certificates will be awarded to the person, persons, or institution which supervised, stimulated, or guided the work of the award winners.

How to Enter Contest

For full details, including rules and entry blanks, write: Research Awards, American Technical Society, 848 East 58th Street, Chicago 37, Illinois.



Artist's sketch of G.E.'s new "Power-Groove" Fluorescent Lamp

shaped in cross section. This design permits a maximum circumference of the tube while constructing its inside area.

The greater light output results from an increase in area of the lighted tube surface, the higher wattage at which the new tube can be operated, and the more effective use of energy within the tube.

The development breaks through a stubborn barrier which has restricted the amount of light obtainable from fluorescent sources, according to Vernet C. Kauffman, manager of engineering for the Large Lamp Department.

Basic length of the Power-Groove will be eight feet, but four-foot lamps will be available to fill in where necessary. A six-foot Power-Groove probably will be developed for street lighting. The lamp is two and one-eighth inches in diameter and is rated at about 200 watts.

More specific information regarding the characteristics of the Power-Groove Flourescent Lamp is available upon request.

(For Convenience Circle Index Code 0608)

NEW KIT OF DEEP-CUT HOLE SAWS FOR FAST BIG-HOLE

To speed up countless jobs in pipe fitting, sheet metal, plumbing, electrical, and general maintenance work, Millers Falls Company, offers this rugged new set of follow-through-type Deep-Cut Hole Saws.

Complete with two mandrels in a compact, sturdy, all-steel box 6 by 4 by 3 in., this Millers Falls Kit No. 1741 packs perfectly in any journeyman's equipment.

Millers Falls Kit No. 1741

The saws in sizes from 1 1/16 in., to 2 9/16 in., diam. have a special high-speed-steel cutting edge welded, by an exclusive Millers Falls process, to a tough chrome-vanadium body. The sharp cutting teeth, four to the inch, bite quickly through most any building material, saving time and money, making light work of tough jobs.

Rugged, essential tools, these Millers Falls

(Continued on next page)

DO YOU USE THESE DELKOTE PRODUCTS?

DELKOTE® WOOD LACQUER is a unique new formulation, which embodies the best in modern lacquer technology. No finer finish is used—even on the highest priced furniture and the best pianos. Yet this lacquer is so formulated that it can be sprayed from an aerosol can!

Now your shop students can easily finish their handiwork with a professional-type lacquer. Two light coats, a little rubbing and polishing, give a deep, rich, long-lasting finish. This new aerosol product makes lacquer actually *easier to use than varnish.*

DELKOTE WOOD LACQUER was just introduced this past spring; yet it is already in use in hundreds of school shops and by maintenance personnel, home handy men, and hobbyists as well. Available in 12-ounce aerosol spray cans at $1.95 each, also in cartons of 12.

DELKOTE METAL LACQUER is a companion product, introduced at the same time. It is formulated to spray perfectly from the aerosol package, and is nonreactive to any metal surface.

It protects, preserves, and beautifies copper, brass, bronze, and aluminum. It prevents tarnishing. It eliminates the need for frequent polishing of hinges, doorknobs, stair rails, and fixtures. A useful material in the shop, it is also being used in school maintenance, office, and home . . . wherever brightwork is a problem.

Like DELKOTE WOOD LACQUER, the METAL LACQUER comes in 12-ounce self-spraying aerosol cans at $1.95 apiece, and in cartons of 12. Mixed cartons are available on special order.

55-V-1

Both DELKOTE WOOD LACQUER and DELKOTE METAL LACQUER are sold by leading school supply distributors. If your regular supplier does not carry them, order direct.

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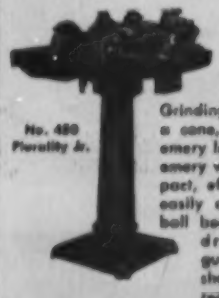

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SHOP EQUIPMENT NEWS

(Continued from previous page)

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Depth of cut is 2½ inches. As the saw follows through its own hole, deeper cuts can be made by removing the core. Good chip removal, necessary for fast cutting, is assured by spiral elevator grooves in the body of the saw.

Both mandrels included have 7/16-in., hex shanks and ⅜-in., pilot drills.

(For Convenience Circle Index Code 0609)

Descriptive Material

NEW NIAGARA BULLETIN 77D

New, illustrated Bulletin 77D, issued by Niagara Machine & Tool Works presents Niagara's complete line of power and hand operated Slip Roll Forming Machines (series 6, 4, 3, 2, 1½ and 1 in.).

Hand Operated Slip Rolls

In addition to containing detailed information and specifications for each of the models, the bulletin graphically illustrates how Niagara Pinch Type Rolls assure production of commercially true cylinders virtually free from flat spots. Included also is an explanation of the factors affecting the selection and operating of Niagara Slip Roll Formers and the special attachments available.

(For Convenience Circle Index Code 0610)

NEW BG 1956 CATALOG

The Brodhead-Garrett Company has just published its 1956 annual catalog. It describes and illustrates the materials, tools (both hand and power), and supplies used in the school shop. This firm pays all shipping charges on orders over $25.

The subject material is listed under art equipment, abrasive cloth and papers, art materials, automotive equipment, benches,

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Get your copy of this complete catalog now.

(For Convenience Circle Index Code 0611)

NEW WILTON CATALOG

A new 38-page catalog has been published by the Wilton Tool Manufacturing Co., Inc. It describes a large number of classroom materials for vocational and industrial-arts instructors. In addition to a complete line of the hand tools used in school shops, the catalog shows and explains completely new powered clamping tools for automation, and illustrates their use in some of the nation's largest mass production plants. The material is especially timely for students about to enter industry, or students who plan to go into engineering, because it shows how the theories of automation are being applied through new tooling developments. This catalog is recommended reference material for all shop libraries.

Write for your free copy.

(For Convenience Circle Index Code 0612)

DESCRIPTIVE MATERIAL AVAILABLE

Duro Metal Products Company has made available descriptive material on their heavy duty belt and disk sander, 26-in. scroll saw, 6-in. jointer, 14 by 38-in. production lathe, and 15-in. band saw.

Each of these power machines is thoroughly described and illustrated, and each description is accompanied by a specification.

Write for your copy of this material.

(For Convenience Circle Index Code 0613)

NEW DREIS & KRUMP BULLETIN

Dreis & Krump Manufacturing Co., has issued a new 4-page bulletin, No. 131-56 illustrating and describing the design and construction features, with complete specifications, of their Model 131, 11-ton capacity Chicago Press Brake.

(For Convenience Circle Index Code 0614)

PLASTICS CATALOG AND PRICE LIST

The Cadillac Plastics and Chemical Co. has issued a 52-page catalog of thermoplastic and phenolic sheets, rods, tubes and films, as stocked by nation's largest plastics warehouse distributor. Miscellaneous resins, cements, and supplies are also listed. Includes comparison table of chemical, electrical, and mechanical properties. Lists available sizes, weights, color ranges, purchasing specifications, and prices. Enables easy price, properties comparison of acrylic, vinyl acetate, polyethylene, polystyrene, nylon, teflon and Kel-F plastics in cast and extruded shapes.

(For Convenience Circle Index Code 0615)

SIMONDS COMPLETE LINE OF "RED TANG" FILES

Simonds Saw and Steel Company announces a complete line of "Red Tang" Files including American Pattern Files and Rasps, "American-Swiss" Swiss Pattern Files, "Vixen" Milled Curved-Tooth Files and Holders, and Rotary Files and Burrs, (High Speed Steel and Carbide).

Complete information on the full line of Simonds "Red Tang" Files may be obtained from Simonds Branches or home office.

(For Convenience Circle Index Code 0616)

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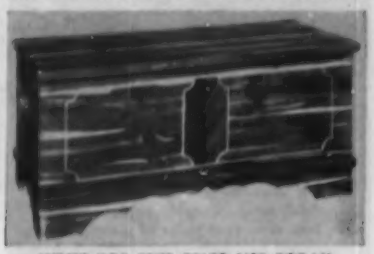

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Business and Personal News

KENNETH M. HENDERSON RECEIVES APPOINTMENT

At a recent board of trustees meeting, Kenneth M. Henderson, president of DITTO, Incorporated, Chicago manufacturer of office duplicating machines and supplies, was appointed chairman of the Board of Overseers of Dartmouth's Amos Tuck School of Business Administration.

Currently he also is director of the Duncan Y.M.C.A., Chicago; director of the Community Fund of Chicago; trustee of the Ravinia Festival Association; and trustee of the Winnetka Congregational Church. He resides at 818 Bryant Ave., Winnetka, Ill.

VILLAUME NAMED EXECUTIVE VICE-PRESIDENT OF I.C.S.

John C. Villaume, vice-president and dean of the faculty of the International Correspondence Schools, Scranton, Pa., was elected executive vice-president of that division of International Textbook Company on April 16, 1956.

A native of Honesdale, Pa., Mr. Villaume is a graduate of Wayne Commercial School, Honesdale. He holds the degree of A.B., from Gettysburg College, Gettysburg, Pa., where he taught and handled public relations, and an M.A. degree from Duke University, Durham, N. C.

He is a director of the Scranton Better Business Bureau and a member of the American Management Association, the American Society of Training Directors, the American Society of Engineering Education and the Scranton Chamber of Commerce. During a five-year association with the University of Scranton, Mr. Villaume taught business management, personnel, office and industrial management and public relations. He is also the author of a text, *Personnel Organization*.

NAME NEW STAFF ASSISTANT

The Brunswick-Balke-Collender Company, Chicago, Ill., have named R. J. Paige staff assistant to the vice-president. The announcement was made by J. J. Stefan, head of the firm's school equipment division.

Mr. Paige joined the Brunswick-Balke-Collender Company in 1950 as senior market analyst in the research department. He has also served as merchandiser of school equipment for the 111-year-old firm.

He had previously worked with Publication Research Service as assistant research director and with the City News Bureau in Chicago.

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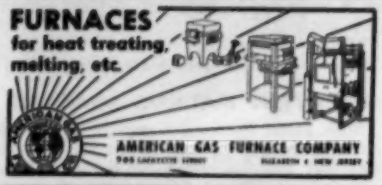

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The index and postpaid cards below are provided for your convenience in requesting product information, catalogs and literature offered by the advertisers and the manufacturers listed in Shop Equipment News. To obtain this information or literature, encircle code numbers, sign the card, tear along perforated lines, and mail. Your request will receive prompt attention.

Code No.		Page No.
60	**American Gas Furnace Co.** Furnaces for heat treating.	26A
61	**American Technical Society** Professional books.	25A
61A	**American Technical Society** A.T.S. Research Awards	23A
62	**Armstrong Bros. Tool Co.** Standard tools of industry.	11A
63	**Atlas Press Company, The** "Do-it-yourself" furniture plans.	26A
64	**Bedford Lumber Co.** Knockdown cedar chests and aromatic red cedar lumber.	24A
65	**Bergen Arts & Crafts** Jewelry making supplies.	26A
66	**Black and Decker Mfg. Co.** Portable electric tools.	2A
67	**Board of Examiners** Teaching positions.	26A
68	**Boice-Crane Company** 10" tilt arbor saw with ball bearing floating drive pulley. Use coupon page 16A.	16A
69	**Brodhead-Barrett Company** New AC-DC power supply unit bench.	22A
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615	**Craftsman Wood Service Company** Complete catalog of wood & woodworking equipment free to instructors. Use coupon page 20A.	20A
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(Index continued on next page)

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These postage cards are provided for the convenience of directors, supervisors, and shop instructors in requesting information on products, services, booklets, and catalogs offered by the advertisers in this issue. Tear along perforated line and mail.

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400 North Broadway, Milwaukee 1, Wisconsin

June, 1956

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61	69	617	625	633	641	649	656
62	610	618	626	634	642	650	657
63	611	619	627	635	643	651	658
64	612	620	628	636	644	652	659
65	613	621	629	637	645	653	660
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64	612	620	628	636	644	652	659
65	613	621	629	637	645	653	660
66	614	622	630	638	646	654	661
67	615	623	631	639	647	61A	

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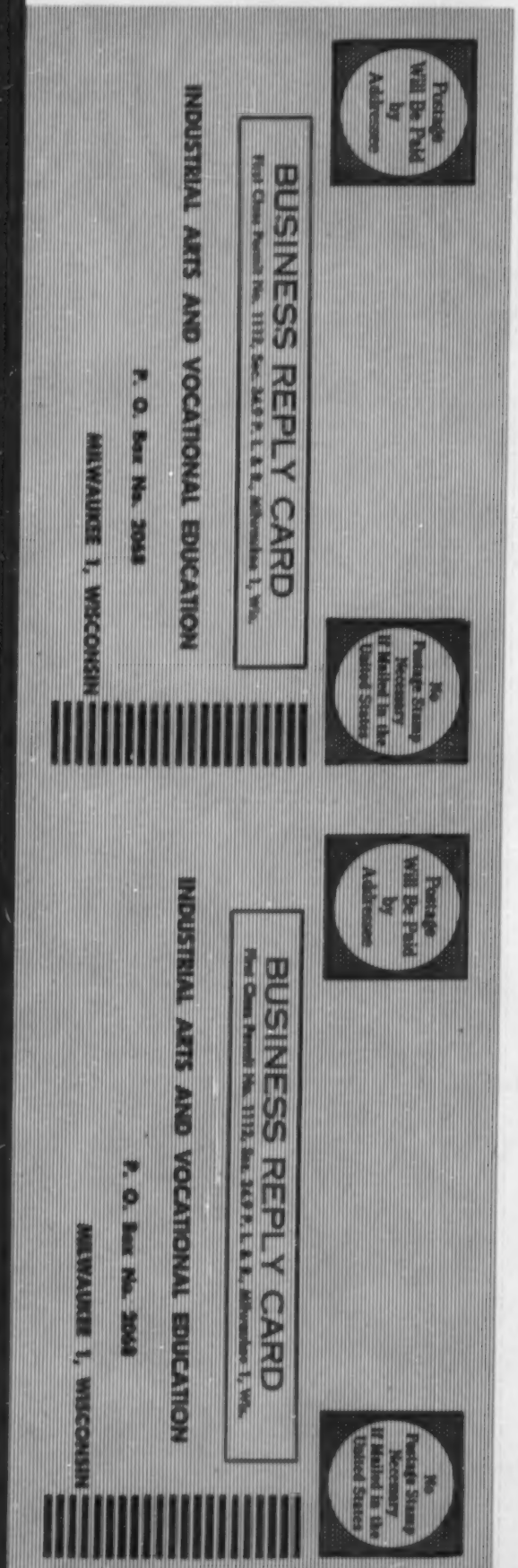
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634	**Logan Engineering Co.** .... 13A Lathes for industrial tool experience.	
635	**Lufkin Rule Co., The** ..... 18A Tapes, rules, precision tools. For information use coupon page 18A.	
636	**Metal Crafts Supply Co.** .... 26A Tools, materials and supplies. Send 50¢ for catalog.	
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641	**Mummert-Dixon Company** . 24A Oil stone grinders. Free details.	
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651	**Simonds Saw & Steel Co.** ... 14A Si-Clone saws.	
652	**South Bend Lathe Works** .. 1A Lathes. For complete information use coupon page 1A.	
653	**Stanley Tools** ..... 9A Electric tools. For detailed information and school shop help use coupon page 9A.	
654	**Starrett Co., The L. S.** ..... 10A Precision tools and instruments.	
655	**Sta-Warm Electric Co.** ..... 26A Glue heater.	
656	**Sterling Wheelbarrow Co.** . 17A Steel flasks.	
657	**Stoner Wood Products Co.** 26A Shop furniture. Free literature.	
658	**Walker-Turner, Inc.** ..... 5A "Light-Heavyweight" 24" four-speed jig saw.	
659	**Weber Company, F.** ..... 24A Drawing materials and instruments.	
660	**Weston Electrical Instrument Company** ..... 17A Miniature clamp. Volt-Ammeter.	
661	**Wilton Tool Mfg. Co.** ..... 7A Aluminum handles on woodworkers vises end injuries. Write for catalog of complete line.	

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0602	**DoAll Co.** ..... 20A Table Extensions for Sawing Metal Plate	
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0606	**L. S. Starrett Co.** ..... 22A No. 657 Magnetic Base Indicator Holder	
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